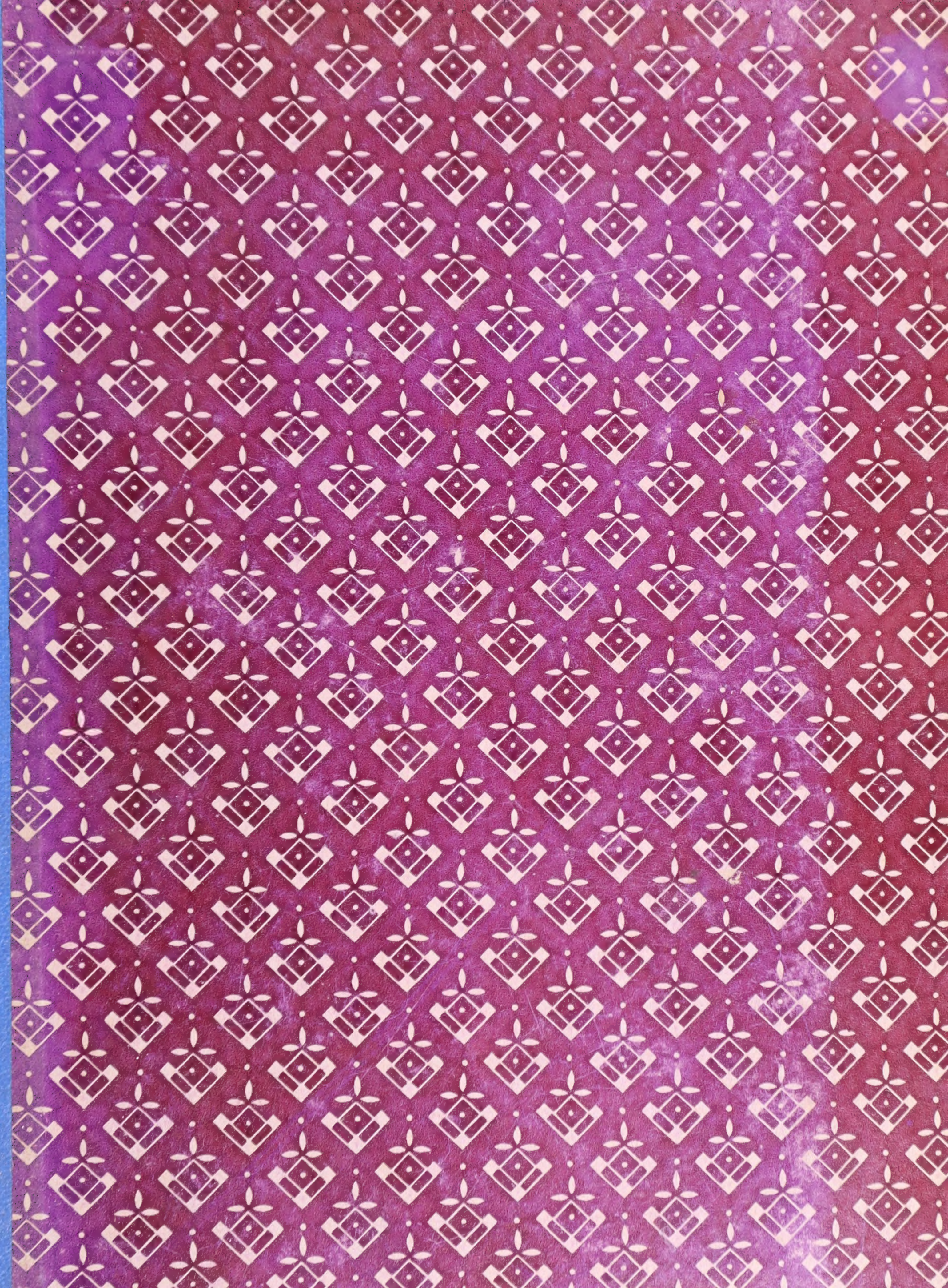

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See also back page

1 R 15
[Salami-style sausage.]
Ishii, B.
Japanese Patent 19577/71 (1971) [Ja]

Mixtures of cuttlefish meat, fish meat and soya bean protein are combined with edible oils and seasonings and smoked conventionally to yield a composition which is then packed into a casing, boiled, and smoked further. IFT

1 R 41
Smoke preservation of frozen horse-mackerel and its quality control.
El-Hidik, M.; Yousef, M. H.
Journal of the Egyptian Veterinary Medical Association 30 (3/4) 141-146 (1970) [5 ref. En] [Meat and Fish Res. Section, Vet. and Res. Lab., Dokki, Cairo, UAR]

Frozen horse mackerel (Stavridia normal) were thawed, pickled in 30% NaCl for 20 h, washed, drained and smoked for 10 h. After drying, chemical and organoleptic analyses were carried out on the fresh smoked fish and smoked fish stored in a refrigerator at 6°C. Raw fish before treatment contained 77.12% moisture, 16.18% protein, 4.90% fat and 1.11% ash; values after smoking were 55.06%, 25.73%, 6.32% and 10.91% respectively, and 8.56% NaCl. After 60 days refrigeration the values were 53.83%, 26.81%, 6.91%, 11.08% and 9.91% respectively. The fish were organoleptically good after 30 days, and acceptable after 45 days refrigeration. PG

1 S 24
A new approach to wood smoke flavouring.
Booth, D. W.; Edwards, J. W.
Food Trade Review 41 (6) 25-26 & 32 (1971) [En] [Hercules Powder Co. Ltd., 1 Great Cumberland Place, London W1H 8AL, UK]

In order to eliminate the direct smoking process, Hercules Powder Co. Ltd. has developed a product sold under the trade mark Hercosef, which is claimed to impart the requisite natural smoked flavour. Application of Hercosef may be by immersion, spraying or injection techniques or in dry forms such as granules or powders. A comparison of the wt. losses of 4 Wiltshire middles (bacon) processed using Hercosef (spraying for 15 min and refrigerated at 35°F for 12 h) and 4 using the traditional method (smoked for 8 h at 90°F and refrigerated for 12 h) shows a lower wt. loss when Hercosef is used, average 0.5% compared to 5.2% for the traditional method. A brief account is given of the manufacture of Hercosef from sawdust by controlled combustion, alkali washing and selective fractionation. Its general characteristics are considered and its non-harmful nature stressed. Treatment with Hercosef is considered to be a faster, safer, cleaner and more reliable method of imparting a smoked flavour. VJG

1 S 45
Bacon production.
Schoch, W. S.; Lewis, R. G. (Armour & Co.)
United States Patent 3 595 679 (1971) [En]

Bacon bellies are cured and smoked in the presence of a polyphosphoric acid salt, after which the moisture content is adjusted so that smoked and chilled wt. is <103% of the green The bellies are then sliced with a high-speed rotary blade. IFT

1 S 52
Boneless turkey roll.
Lind, J. H.; Abrahamson, H. M.
United States Patent 3 595 682 (1971) [En]

Process for preparing a smoked, boneless, ful cooked, ready-to-eat turkey roll permits formi the roll by using the turkey skin for a natural outer casing. The roll is held in a stretchable net during cooking and smoking, but the net ea removed before sale. IFT

1 S 84
[Process for producing smoked meat e.g. ham.]
Verfahren zur Herstellung eines rauchigen Fleisches, wie Schinken und dergleichen Rauchfleisch.
Henning, W.
West German Patent Application 1 692 128 (19
[De]

Before, after, or during sodium nitrite treatment, raw meat is injected with a 10-20% brine containing active smoking constituents. amount injected is ~10-20% of the wt. of the The amount of smoking constituents required give the desired flavour is 10-20× the amount required to impart the same flavour to water. meat is ready to eat within a few h, and is then preferably sliced and vacuum-packaged. The le curing process is thereby eliminated. W&Co

1 T 6
[Effect of polyhydroxyphenols on antioxidativ activity of wood smoke.]
Grabowska, J.
Roczniki Panstwowego Zakladu Higieny 22 (3 347 (1971) [10 ref. Pl] [Zakad Tech. Utrwalania Zywnosci i Mikrobiologii Tech. Politech. Gdan Poland]

A modified colorimetric method with 4-ami antipyrene was used to determine selectively 2- and 3-hydroxyphenols in presence of other ph compounds in wood smoke. A correlation was between the contents of these phenols and the antioxidative activity of the smoke solution.

1 T 43
[Process for producing a smoking agent for treating food products.] Verfahren zur Herste eines Räuchermittels zur Behandlung von Nahrungsmitteln.
Fessmann, G.
West German Patent Application 1 692 117 (1
[De]

A smoking medium for meat, sausages, chee etc., is obtained by passing through sawdust superheated steam at ≤390°C, and to which p O_2-enriched air or a mixture of an inert gas ar O_2 is added. The steam entrains the active smo

constituents produced by pyrolytic and
n processes, and it is used as a smoking
her in the gaseous state or, after
ation, in the liquid state. The amount of
added is ⩽3.5 parts/100 parts steam (by
e total amount of O_2 present is 0.5-5
his is said to eliminate excessively
avour. W&Co

ons of wood smoke components with protein
o acids.
B.; Issenberg, P.
s of Papers. American Chemical Society
FD 43 (1971) [En] [Dept. of Nutr. and Food
of Tech., Cambridge, Massachusetts
SA]
ons between carbonyl components of smoke
o groups of amino acids and proteins have
licated as causes of loss of available
smoked food products. Wood smoke
tes were separated into phenolic, neutral,
fractions. Both phenolic and neutral
caused a significant loss of available
en applied to ground pork preparations.
me pure phenolic components, previously
l in wood smoke condensates, reacted with
ginine, and casein, a variety of colours
rved. The coloured casein showed a
t loss in available lysine. Relative
es of some phenolic and carbonyl
nts with the free amino groups of proteins
ared. Interactions between phenolic smoke
nts and food proteins may play an important
termining colour of smoked foods and
al and functional values of their
AS

nd apparatus for smoking food products.]
n und Vorrichtung zum Räuchern von
tteln.
H. (Fa. Hans Schröder)
man Patent Application 1 945 943 (1971)

heese etc. is pre-dried with O_3-enriched,
or ~9 hr, and is then smoked with the
of moist air at 7-14°C. The pre-drying
ents extraction of meat juice, and the
ired for smoking is reduced. W&Co

nd apparatus for treating food
in an air-conditioned room with air
n.] Verfahren und Vorrichtung zum
n von Lebensmitteln in einem
rten Raum unter Luftumwälzung.
dorf, L.
man Patent Application 1 959 439 (1971)

s, meat or fish are matured, dried or
in a room which has 2 complete air-
ing units arranged at opposite ends, the
e heating and cooling capacities
corresponding to the max. requirements. Initially, both units operate until a given value is obtained, when they are switched to alternating operation. Smoke may be introduced simultaneously. Treatment is uniform. W&Co

2 R 75
New Findus fish factory has process capability of 13 000 tons per year.
Anon.
Food Manufacture 46 (6) 77-78 (1971) [En]

The Findus fish-processing factory at West Tullos Industrial Estate, Aberdeen, is described: total processing capacity is ~13 500 tons of fish/yr. Processing of cod, haddock, plaice, coley, herring, kipper and cook-in-bag products is described, with reference to cold storage, bacteriological quality control, cleaning, filleting, smoking, breading, packaging, freezing, washing and sterilization of boxes, and ultrasonic cleaning of equipment. The company is conducting a contract fishing experiment, and intends to replace imports with Scottish and other UK-produced fish. AJDW

2 R 78
[Utilization of deep-chilled cod for further processing.]
Maslova, G. V.; Nozdrunkova, I. R.;
Prudovskaya, E. Ya.; Krylov, B. K.
Rybnoe Khozyaistvo 47 (3) 65-68 (1971) [Ru]
[NIKIMRP, USSR]

Results of experimental manufacture of canned fish (cod in oil), smoked cod, and cod as a semiprocessed food manufactured from deep-chilled fish are given. The fish were chilled by contact method to ~-3°C; prior to storage; the temp. of fish was -2°C. On thawing the cod, partial swelling occurred (1.5% in terms of vol.); a wt. loss (1.0%) was incurred when frozen cod was defrosted. Total losses during production of canned fish were 36%, which was less than with cooled fish (38%) or frozen fish (42%). Also the organoleptic values of produce manufactured from deep chilled cod were higher than from frozen fish. Similar results were obtained in other products based on deep-chilled cod. STI

2 R 79
[Changes in properties of Baltic herring tissue during hot smoking by infrared heating.]
Radakova, T. N.
Rybnoe Khozyaistvo 47 (3) 72-73 (1971) [Ru]
[VNIRO, USSR]

Chemical and physico-chemical changes in herring tissue investigated included contents of water, total N, albumin and nonalbumin N, soluble protein N, and water retention ability of the tissue. Electronically smoked tissue was subjected to two-side IR heating for 6 min. Under these conditions, considerable denaturation of proteins occurred. The water-retaining ability was reduced by 17.4%. Prolonged heat treatment (>6 min) was followed by thermolysis of collagen accompanied by glutin generation, which increased the moisture-retaining capacity again. Non-albumin N content increased due to hydrolysis. STI

2 T 103

[Process for producing a smoking medium for smoking food products.] Verfahren zur Herstellung eines Räuchermittels zum Räuchern von Nahrungsmitteln.

Fessmann, G.

West German Patent Application 1 692 116 (1971) [De]

A smoking medium for meat, sausages, fish and cheese is produced by passing through sawdust a mixture of superheated steam and O_2, O_2-enriched air, or a mixture of an inert gas and O_2 which will sustain a visible combustion; the temp. of the steam - O_2 mixture is <700°C. The total amount of O_2 present is ~3.5-12 parts/100 parts steam, by vol. The smoke generated may at least partly be condensed on the food product, or is liquified by cooling to 0°C. W&Co

2 T 120

[The choice of indicators to smoking liquid quality.]

Lapshin, I. I.; Rodina, T. G.; Yakushova, L. P.

Rybnoe Khozyaistvo 47 (3) 68-72 (1971) [Ru] [Moskovskii Inst. Narodnogo Khozyaistva im. G. V. Plekhanova, USSR]

Various chemical and physico-chemical factors were studied to find methods for objective evaluation of smoking liquid quality. Sp. wt., optical density, and DM content were found inadequate. The most suitable factors for determining the quality of smoking liquid were found to be titratable acidity and phenol number after reaction with formaldehyde. Due to poor reliability of the analysis, volatile acids, and DM contents were not suitable for quality evaluation. pH can serve as an indicator. STI

3 E 130

[The modified PSM-VNIRO smoke generator.]

Popov, M. V.

Trudy Vsesoyuznogo Nauchno-issledovatel'skogo Instituta Morskogo Rybnogo Khozyaistva i Okeanografii 78: 54-58 (1971) [Ru, en, fr] [Vses. Nauchno-issled, Inst. Morskogo Rybnogo Khozyaistva i Okeanografii, Moscow, USSR]

The original PSM-VNIRO smoke generator consisted of a feed mechanism for delivering metered quantities of wood shavings to the hearth, of a smoke generating section and of an ash collector. The modified generator (PSM-2), while working on the same principle, has been simplified in comparison with the original version mainly by less accurate metering of wood shavings, and by constructional changes in hearth, control of combustion temp. (by hand using a millivoltmeter and a thermocouple instead of electronic sensors maintaining the temp. at ±2°C but requiring skilled servicing), and in the ash collector (a simple pan with water in PSM-2). It is considered that simplicity in use and servicing of the generator compensates for the possible reduction in quality of generated smoke. SKK

3J433

Effects of smoking on some physiological changes in bananas.

Narasinhan, P.; Dalal, V. B.; Nagaraja, N.; Krishnaprakesh, M. S.; Anla, B. L.

Journal of Food Science and Technology (Mysore) 8 (2) 84-85 [3 ref. En] [Central Food Tech. Res. Inst., Mysore - 2A, India]

Physiological changes in bananas ripened by the traditional practice of smoking for 24 to 36 h and subsequent storage at room temp., were investigat It was found that banana tissue in smoked fruit contain 50-100% more CO_2 compared to that of unsmoked bananas. The colour of the smoked sample changed from green to yellow in 5 days compared to the unsmoked sample which took 7 days. The fruit in the smoked group became edible, ripe and soft in 7 days whilst the fruit in the unsmoked group was yellow and hard even on the 8th day. The pulp/peel ratio increased from 1.45 to 2.50 in the smoked samples as against 1.45 to 2.21 in the unsmoked samples. The non-reducing and total sugars showed higher values in the smoked samples and the heat of respiration at the climacteric peak in smoked fruit was 21 340 Btu/ton/24 h while unsmoked fruit gave 17 600 Btu/ton/24 h. Reducing sugars did not show any appreciable difference. AB

3 R 115

[Detection of Clostridium botulinum type E in vacuum-packed smoked trout fillets.] Nachweis vo Clostridium botulinum Typ E bei handelsfertigen Forellen.

Baumgart, J.

Fleischwirtschaft 50 (11) 1545-1546 (1970) [15 ref. De, en]

3 R 127

[Flameless atomic absorption spectrophotometry fo the determination of mercury.]

Cumont, G.

Chimie Analytique 53 (10) 634-645 (1971) [12 ref. Fr, en] [Lab. Central de Rech. Vet., 22 rue Pierre Curie, 94-Alfort, France]

2 flameless atomic absorption methods for determination of sub-μg quantities of inorganic Hg, based on absorption of the 253.7 nm Hg resonance line by Hg vapour, are described. In the first method, Hg is collected on a Pt wire from a digest by HNO_3 in a sealed ampoule: Hg deposit is volatilized by electrical heating (Joule effect). Detection limit is 0.5 ng. The second method is based on gentle digestion of organic material by H_2SO_4-HNO_3 mixture in the presence of vanadium oxide, with cooling, followed by reduction by $SnCl_2$. Detection limit was 2 ng, total time required <1 h and SD was smaller than with the first method. The following results (ppm) were obtained by the 2 methods: fresh salmon 0.030 ± 0.015 and 0.020 ± 0.005; frozen salmon 0.025 ± 0.005 and 0.024 ± 0.004; smoked salmon 0.120 ± 0.030 and 0.115 ± 0.015; canned salmon 0.065 ± 0.015 and 0.044 ± 0.010; canned tunny - Pacific 0.340 ± 0.04 and 0.300 ± 0.022; Atlantic 0.350 ± 0.060 and 0.280 ± 0.020; Atlantic 0.200 ± 0.020 and 0.160 ± 0.015; S. Atlantic 0.600 ± 0.070 and 0.560 ± 0.050; frozen Pacific tunny 1.200 ± 0.100 and 1.140 ± 0.060; fresh pike 0.650 ± 0.080 and 0.600 ± 0.300; frozen pike 0.250 ± 0.040 and 0.240 ± 0.012. The method was also suitable for

ther products suspected of
ation by Hg fungicides, e.g. game such as
RM

nciples applied to quality control and
f smoked products in Yugoslavia.]
ch, Ya.
Industriya SSSR 42 (4) 41-42 (1971) [Ru]
ogicheskoe Otdelenie
ozyaistvennogo Univ., Belgrade,
a]
rinciples of quality control of smoked
ugoslavia are given in a law covering
omposition of individual meat products,
g technology, and quality of raw
and finished products, including
tic characteristics, packaging and
and storage conditions. In addition to
cted products there is a second group of
whose characteristics and parameters are
by the producers, i.e. specifications
the name of the product, classification,
on, technology and organoleptic
istics. The whole classification and
stem is illustrated using
ers as an example. STI

neasurements in frankfurter-type sausages]
ungen an Brühwurst.
, H.
rtschaft 50 (10) 1409-1411 (1970) [De,
ebhuhnweg 21, 2000 Hamburg 61, W.
]
velopment of colour in frankfurter-type
in the skin as well as in a cross
uring smoking was measured with a
tintometer type AF 700. After the
of smoking the red colour component
continuously on the skin and after 35
ed a constant max. The yellow component
rapidly after initial retardation and
ed its max. after ~35 min. The blue
nt showed only a slight rise during the
process; only after the max. skin colour
reached was an increase in colour
in the cross-section. FWJ

g and organoleptic properties of normal
orcine muscle. (In "Proceedings of the
national Symposium on condition and meat
pigs".)
. A.
70 (1971) [20 ref. En] Wageningen, The
ds: Centre for Agric. Publishing and
tation [Dept. of Food Sci., St. Univ., East
Michigan 48823, USA]
arison of normal and PSE (pale, soft,
) pork loins, was made, and bologna and
nd canned hams from each quality group
ied to observe organoleptic and
properties. The effects of phosphate in
bologna processing and final processing
moked hams were observed. Heat
and freezer storage resulted in greater

losses among PSE muscles. Added phosphates significantly improved the yield of PSE bologna and hams. PSE muscles were more tender, higher in thiobarbituric acid values and lower in emulsifying capacity than normal muscles. Panel acceptability scores of pork loin roasts were not significantly different between quality groups, but normal bologna and ham semimembranosus muscl were usually preferred to PSE muscles. Phosphates improved uniformity of colour score in PSE muscles and also slightly improved overall acceptability scores. AS

3 S 300
[Methanol in raw pork sausages.]
Pyrcz, J.; Pezacki, W.; Duda, Z.
Przemysl Spozywczy 25 (9) 336-339 (1971) [13 ref. Pl, ru, en, fr, de]

Methanol was determined by GLC after steam distillation in 4 varieties of pork sausage of the 'serwolatka' type made respectively without sucrose or with addition of 0.2, 0.5 or 2.0% sucrose to the mix. The determinations were carried out on the mix before filling, after ripening for 4 days, after smoking for 48 h and after subsequent storage for 10, 20 and 40 days. The results are graphically presented. Methanol was detected in all samples at all stages of manufacture and storage, max. values of 55 ± 10 μg/10 g fat-free DM being found immediately after smoking. There were no significant differences between the 4 varieties of sausage. It is considered that the methanol arose from deamination and decarboxylation of the protein components of the mix and was also contributed by wood pyrolysis during smoking. SKK

3 S 315
Additives and their influence upon technology and quality of meat products. [A symposium]
Wyler, O. D.
IFST Proceedings 4 (3, part II) 167-174 (1971) [En] [Chem. Section, Swiss Fed. Vet. Office, Berne, Switzerland]

Meat, frozen meat and meat products and conserves are defined. The action of the chief additives in use (common salt and natural colouring additives such as saltpetre, nitrite and sulphurous acid) are generally discussed. Use of glucono-δ-lactone, starter cultures as acidifying agents, spices, condiments such as glutamates and ribonucleotides, and antioxidants is also briefly considered. Tables of meat additives in general use, other meat product additives (acids and salts, smoke, antioxidants, flavour enhancers, constitution-influencing additives, starch and higher dextrins, colouring spices, meat tenderizers, chemical preservatives etc.), unintentional or undesirable additives (hormones, antibiotics, pesticides) and their reaction and effects are given. PG

3 S 318
Control and evaluation of spoilage. [A symposium]
Dainty, R. H.
IFST Proceedings 4 (3, part II) 178-189 (1971) [Numerous ref. En] [Meat Res. Inst., Langford, Bristol, UK]

Control of spoilage and hence increase in storage life of meat is effected by a combination of prevention of microbial contamination, destruction of microbes which gain access to the product, and establishment of environmental conditions which prevent or retard development of contaminating micro-organisms. Avoidance of pre-slaughter house by knives and wiping cloths, use of water sprays at 75-90°C to clean carcasses, rapid cooling of carcasses to 5°C or below, moderate drying with avoidance of uneconomic wt. loss, refrigeration and freezing, packaging to encourage an atm. high in CO_2 and low in O_2, curing using NaCl and hintrite, smoking, and the use of γ-irradiation are generally reviewed as means of preventing spoilage. Evaluation of extent of spoilage is generally by enumeration of total numbers of micro-organisms present or by estimation of the groups of organisms known to be commonly dominant on the particular type of meat, but measurement of overall metabolic activity e.g. by dye reduction, changes in concn. of low mol. wt. N-containing compounds, changes in pH and measurement of extract release vol used. The results should correlate with subjectice organoleptic properties.   PG

3 S 360

Effect of quality attributes upon processing and palatability characteristics of commercially cured hams.

Cross, H. R.; Smith, G. C.; Carpenter, Z. L.

Journal of Food Science 36 (7) 982-986 (1971) [12 ref. En] [Dept. of Animal Sci., Meats & Meat Chem. Section, Agric. Expt. Sta., A&M Univ., College Station, Texas 77843, USA]

488 fresh hams were stratified by method of cure (regular-cured (RC) and water-added (WA)) and quality score (gross morphology (GM), colour, firmness). Each ham was pumped, cured and smoked. Wt. for each ham were obtained at each processing stage. Centre slices from 50 hams were evaluated for muscle colour, chemical composition and organoleptic properties. Among all hams, GM groups were not significantly ($P<0.05$) related to wt. gains (fresh to chilled), wt. losses during period in transit (125 km), or flavour, saltiness, moisture (%) or pigment concn. for combined muscles of centre slices. Comparison of individual muscles revealed that biceps femoris (BF) was less tender than semitendinosus (ST); ST was less salty than emimembranosus (SM) and ST had a higher fat content (moisture-free basis) than other muscles for both RC and WA hams. Significant differences ($P<0.05$) among muscles for flavour and juiciness were evident for RC hams; there were no significant differences for WA hams. There were significant differences in pigment concn. among muscles from centre slices from WA hams. RC hams in GM group 5 were significantly ($P<0.05$) more juicy and tender than hams in other groups. Also, centre slices from hams in high quality GM group 5 were more uniform in muscle colour, more desirable in lean colour and contained more fat than hams in group 1. RC hams in GM group 5 also produced individual muscles which were more desirable in lean colour (SM, BF), more flavourful (SM), more juicy (ST, BF) and more tender (ST, BF) than hams in group 1. WA hams in GM groups 5 did not differ from hams in group 1 in any traits but were significantly ($P<0.05$) more tender than those in group 2.   AS

3 U 142

[Smoked, dressed, and lump pork. General specifications.]

Hungary, Magyar Szabvanyügyi Hivatal

Hungarian Standard MSZ 19423-69 3pp. (1970) [Hu]

This standard replaces MSZ 5875-55, MSZ 5880-53, MSZ 19420-55, MSZ 19421-65 and MSZ 19423-57. It applies to smoked raw or boiled pork and beef and pork veal or beef tongue. KNO_3 content should be ⩽0.2%, NaCl content ⩽6%, for raw smoked produc and ⩽3.5% for cooked products. The shelf-life of slow-cured products must be ⩾21 days, and for rapid-cured product ⩾6 days.   GB

4 P 461

[Improving the manufacture of smoked cheeses. (In "Proceedings of Inter-University Dairy Conference".)] In "Sbornik dokladov mezhvuzovskoi konferentsii po molochnomu delu".

Chebotarev, A.; Kunizhev, S.

pp. 171-174 (1971) [13 ref. Ru] Erevan, USSR: Izdatel'stvo Aiastan [Vologodskii Molochnyi Inst., USSR]

The suitability of 4 smoking preparations developed by 3 Soviet research institutes was studied in laboratory and semi-commercial trials. The optimum results were obtained by a combined treatment with the 2 compounds, as described in FSTA (117 as described in FSTA (1971) **2** 1P103. In organoleptic tests the cheeses treated by this method were at least as good as the controls smoked using smoke, and were free of 3,4-benzpyrene. The range of smoked cheeses manufactured in the USSR includes processed cheese as well as natural cheeses (Vologda, Kabardinskii, Kavkazskii and Suluguni).   FL

4 R 159

[Cold-smoke treatment of fish and fish products.]

Über das Kaltrauchverfahren von Fisch und Fischprodukten.

Iltscheff, S.; Kalev, S.

***Kälte* 24** (9) 406-408, 410-411 & 413 (1971) [6 ref. De]

The tecnique of cold-smoked preservation of fish and fish products is described, with particular reference to the types of cold-smoking plant available (chamber, tunnel, tower), the effect of local climatic conditions, the preliminary drying step and the properties of the smoke used. The importance of the correct choice of equipment design is stressed, and typical processing parameters are produced in diagrammatical form.   HBr

4 R 163

Effects of gamma irradiation on Salmonella spp. in smoked lake whitefish (Coregonus clupeaformis).

Ostovar, K.; Pereira, R. R.; Gallop, R. A.

***Journal of the Fisheries Research Board of Canada* 28** (5) 643-646 (1971) [17 ref. En, fr] [Dept. of Fisheries & Forestry, Winnipeg, Manitoba, Canada]

A dosage of 0.5 Mrad was found sufficient to
ninate 3 spp. of Salmonella in smoked lake
tefish (Coregonus clupeaformis) regardless of
stage of processing at which steaks were
culated with the bacteria. All 3 spp. survived
oking at temp. ≤167°F. The dosages required
elimination of the bacteria when steaks were
culated at various stages of processing were:
ore freezing at 0°F for 48 h, 0.4 Mrad for Salm.
e, 0.3 for Salm. typhimurium, and 0.2 for Salm.
a; before brining at 60 Salometer for 25 min,
, 0.3, and 0.3; after smoking, 0.5, 0.4, and 0.35.
m. give was more resistant to heat than the
er 2 spp.   AS

196
atures of technological systems used for the
-smoking of fish.]
skresenskii, N. A.
bnoe Khozyaistvo **47** (5) 54-56 (1971) [1 ref.
] [VNIRO, USSR]
Technological systems used for the hot-curing
fish in box and tunnel ovens with a 3-stage
np. regime (drying, baking and smoking) are
cussed. The smoking process proper is
ompanied by a drop in temp. In order to
intain a satisfactory quality in the smoked fish,
necessary to supply smoke at a different
np. for each stage of the overall process. This
blem has not yet been solved satisfactorily, so
t box-type ovens continue to remain in use.

380
imination of smoke in sausage production.]
ylova, N. N.; Volovinskaya, V. P.; Gorbatov, V.
; Lyaskovskaya, I. N.; Bazarova, K. I.;
lamova, R. I.; Yakovleva, G. A.
udy, Vsesoyuznyi Nauchno-Issledovatel'skii
titut Myasnoi Promyshlennosti **22**: 17-33
969) [29 ref. Ru, en, de]
A comparative study on the use of 9 smoking
dia obtained by wood pyrolysis in meat
oking is described. The smoking media differed
volatile acid composition, number of carbonyl
npounds, phenol compounds, ether, methanol
l non-volatile substances and solids contents.
ost of the smoking media contain acetic and
mic acids, methil esters, pyrogallol, guaiacol,
n-cresol, furfural, esters and methanol.   STI

473
ozen fried meat "shashlik".]
charava, I. A.
nservnaya i Ovoshchesushil'naya
omyshlennost' **1971** (6) 8-10 (1971) [1 ref
]
The production of frozen convenience foods was
rted in the experimental preserving plant in
chi and the Crimea Canning Factory in the last
in 1970 >3.6 million portions of various foods
re produced in Sochi alone. A new line is
shashlik, which is produced by continuous frying in animal fats in furnaces, and continuous curing of the meat by smoke in an adsorber. The smoke is produced in a generator from hard wood shavings. The meat, stored in a refrigerator, is first trimmed and then cut into pieces of 30-40 g; the cold meat is then pickled for 3-4 h in a pickling liquid comprising vinegar, or citric acid, ground pepper and onion. This is followed by frying at 150-170°C and smoking in a worm type adsorber. The finished product is filled into cellophane wrappings, frozen to a temp. of -33° to -35°C and then packed into cardboard boxes. The products were stored for 3 months at a max. temp. of -18°C. During this period, the DM content increased from 53.2 to 53.5%, fat content from 24.6 to 24.7%, total N dropped from 4.72 to 4.67%, amino N from 0.28 to 0.24%, but ammonia N increased from 0.07 to 0.12%. The acid number rose from 3.46 to 3.85, the I number dropped from 58 to 57, and the peroxide number rose from 0.068 to 0.074.   STI

4 S 486
[Study on volatile aliphatic acid content of meat during processing.]
Krylova, N. N.; Bazarova, K. I.
Trudy, Vsesoyuznyi Nauchno-Issledovatel'skii Institut Myasnoi Promyshlennosti **22**: 152-156 (1969) [4 ref. Ru, en, de]

The volatile aliphatic acid (VAA) content of chilled, cured and smoked pork was studied. Gas and ion-exchange chromatobraphy were used for separation and determination of VAA, and for isolating and quantitatively determining 7 C_2-C_7 aliphatic acids in pork. Mathematical analysis confirmed that the VAA content of cured meat falls to 50% of the original amount; however, subsequent smoking contributes to higher VAA content compared with the initial content in chilled meat.   STI

4 T 216
[Psychrometer measurement of moisture content in curing smoke.]
Bunin. D. Kh
Trudy Vsesoyuznogo Nauchno-issledovatel'skogo Instituta Morskogo Rybnogo Khozyaistva i Okeanografii **78**: 74-84 (1971) [6 ref. Ru, en, fr] [Vses. Nauchno-issled. Inst. Morskogo Rybnogo Khozyaistva i Okeandogii. Moscow, USSR]

A laboratory smoke generator for controlled generation of smoke from 30 g portions of wood shavings at a hearth temp. of ~550°C is diagrammatically illustrated and described. Moisture contents of the smoke (i) derived from psychrometer measurements were compared with those (ii) analytically determined. (i) and (ii) values were 10.53 and 10.05 g/m^3 at a smoke wt. of 1482 mg/m^3 and 15.27 and 10.01 g/m^3 at a smoke wt. of 5038 mg/m^3; the difference changed rectilinearly between these 2 smoke values, and remained almost constant at concn. <~1500 mg/m^3.

It is suggested that psychrometric assessment of smoke moisture be best carried out at smoke wt. of ≤ 1200 mg/m^3 when difference between (i) and (ii) should not be >5%. SKK

4 T 228

[Physical properties of curing smoke produced by friction.]

Khvan, E. A.; Blekus, V. G.; Sadovskii, B. F.; Voskresenskii, N. A.

Rybnoe Khozyaistvo **47** (9) 57-59 (1971) [Ru] [VNIRO, USSR]

A laboratory equipment was used to ascertain the physical characteristics (wt. concn., dispersion composition, final concn., mean value of particle radius) in smoke produced by friction. The smoke was generated by use of wooden blocks (pine, fir, beech, oak, birch), pressed against a rotating metal disc with a force of 0.3-1.8 kg/cm^2. The properties of the smoke varied with the wood used. Increased pressure raised the smoke concn. to a max. after which it decreased; no decrease was obtained with beech wood. The decrease of smoke concn. is due to slower disc rotation at higher pressures. The wood from deciduous trees was found to be more suitable for generating smoke by friction. STI

4 T 265

Hickory-flavoured yeast.

Wasserman, A. E. **(United States of America,** Department of Agriculture)

United States Patent 3 615 728 (1971) [En]

Hickory smoke colour and flavour are imparted to yeast powder by treating it with hickory smoke components dissolved in a volatile solvent, such as diethyl ether or ethanol. IFT

4 T 268

Smoking process.

Baker, H. O.; Hoff, J. E. (Peter Eckrich & Sons Inc.)

United States Patent 3 615 729 (1971) [En]

Removal of carcinogens from natural hardwood smoke is effected by cycling conventionally generated smoke to remove a substantial portion of the particulate phase and/or by regenerating a condensed natural hardwood smoke in the presence of heat. IFT

4 T 269

[Process for producing a smoking medium.]

Verfahren zur Herstellung eines Räuchermittels.

Fessmann, G.

West German Patent Application 1 792 699 (1971) [De]

Sawdust layer is continuously fed through a superheated steam stream, and the amount of sawdust is controlled, as are the steam temp. and quantity, such that only part of the layer is thermally decomposed by the steam, and the rest acts as a filter layer for the vaporous smoking medium for foods. W&Co

5 R 262

Thawing and salting large fish.

Golovkin, N. A.; Gadziyeva, S. G.

Proceedings of the International Congress of Refrigeration (12th Madrid) **3**: 291-298 (1967, publ. 1969) [9 ref. En, fr] [Tech. Inst. of Refrigeration Ind., Leningrad, USSR]

A method for simultaneous thawing and salting of fish is described. the frozen fish is injected with 14-16% brine at a temp. of 40°C and a pressure of 1.5-2 atm. The distance between the injections along the spine is 15 to 21 cm. Hot smoked fish, produced by this method a 6.2% wt. increase compared with a 4% wt. reduction for conventional methods of thawing in air and salting. MEG

5 S 539

[Bacteriostatic properties of wood smoke extract.]

Rojowska, I.

Roczniki Instytutu Przemyslu Miesnego **6** (1) 123-134 (1969) [10 ref. Pl, ru, en]

Microbiological examination of small sausages containing 60 and 120 ppm of wood smoke extract (WSE) was carried out after 5, 24, 48 and 120 h storage at 4° and 18°C. The influence of the extract on the lethal effect of the thermal process and its bacteriostatic activity during storage were determined. Addition of WSE increased the effectiveness of thermal treatment; the death-rate of bacteria was approx. proportional to the 4th root of WSE concn. The bacteriostatic effectiveness was approx. doubled at 4°C in comparison with that at 18°C. AS

5 S 540

Easy way to apply flavour.

Anon.

Food Engineering **44** (1) 107-108 (1972) [En]

A description is given of an in-line unit, at Krey Packing Co.'s sausage plant in St. Louis, that spray-flavours skinless wieners at 1800 lb/h. The flavour-sprayer uses liquid smoke flavour (Solu-Smoke) which contains real hickory smoke. AB

5 S 572

[Method for imparting a regular shape to food products, particulary meat and meat products.]

Keizer, R. de

Netherlands Patent Application 7 104 409 (1971) [Nl]

Meat products to be pickled and possibly smoked are extructed into a tubular, preferably knitted net which has a predetermined stretchability transversally and preferably also longitudinally. The net is made of cotton or synthetic filaments or a combination of both. Incorporation of crimped nylon yarn prevents formation of ladders when the net is cut. The net is a substitute for synthetic sausage casings. It permits easier access for the brine, and imparts a uniform shape to meat products with consequently uniform pickling times. W&Co

S 600
**ffect of dried milk addition on the quality of
noked meat products.]**
erezenko, H. M.
harchova Promislovist **1971** (4) 30-32 (1971)
'k]

The article gives recipes from new kinds of moked meat products, and shows the favourable ffect of adding blood plasma and dried skim-milk n the nutritive value of the products. Also ddition of 0.006% of the proteolytic enzymatic reparation "Terrizin PK" to the minced meat nproves the quality of the product and enhances he assimilation of proteins. STI

S 654
on-standard, high protein sausage formula sells.
[illegible]
ood Processing **33** (1) 29 (1972) [En]

A sausage item containing soy protein oncentrate which increases protein content from 2-13% to 14-14.5%, and containing only 22-23% fat gainst the legal limit of 29-30% has been produced y Edwards Sausage Co. Hydrated soy concentrate added to chopped meat, the mix is emulsified, easons and stuffed on standard equipment. After moking, the sausages are peeled and packaged into 2 oz packages. Selling price of the sausage roducts is 6-7 cents/lb lower than all-meat rankfurters because of the lower cost/lb of the concentrate compared to meat. PG

5 T 286
**Organoleptic characteristics of the dispersing and
ispersed phases of curing smoke.]**
Daun, H.
Roczniki Instytutu Przemyslu Miesnego **7** (1) 77-81 (1970) [13 ref. Pl, ru, en] [Katedra Tech. Zwierzecych Produktow Spozywczych, Politechnika, Gdansk, Poland]

5 T 312
Ham and bacon flavours.
Thomas, P. D. (Pfizer Inc.)
United States Patent 3 615 698 (1971) [En]

Method for preparing synthetic ham and bacon-flavoured compositions involves reaction, at elevated temp. of amino acids, sugars, vegetable protein hydrolysate, monosodium glutamate and edible fat; cooling; and further addition of 5'-ribonucleotides and hickory-smoke flavour. IFT

5 T 313
Smoke flavouring.
Fessmann, G.
United States Patent 3 634 108 (1972) [En]

Process is described for treating foods with a smoking fluid produced by bringing finely divided wood chips or sawdust into contact with superheated steam. IFT

5 U 244
['Balyk' smoked and baked beef sausage: quality requirements for certified product.]
Union of Soviet Socialist Republics,
Gosudarstvennyi Komitet Standartov
Soviet Standard **GOST 5.873-71** 4pp. (1971)
[Ru] [Moscow, USSR]

This standard covers 'Balyk' smoked and baked beef sausage awarded the state mark of quality. Standards on technological requirements, composition and organoleptic characteristics include: cooking salt, ≤2.5%; sodium nitrite, ≤4 mg/100 g. Regulations on analysis, packaging, labelling, transport, storage and supplier's guarantee are listed. SKK

5 U 246
[Lightly smoked sausages: quality requirements for certified products.]
Union of Soviet Socialist Republics,
Gosudarstvennyi Komitet Standartov
Soviet Standard **GOST 5.101-71** 5pp. (1971)
[Ru] [Moscow, USSR]

This standard replaces **GOST 5.101-68** and covers highest quality lightly smoked sausages awarded the state mark of quality and, according to composition and treatment, bearing the names: (i) 'Okhotnich'i kolbaski' and (ii) 'Armavirskaya'. Standards on technological requirements, composition and organoleptic characteristics include for (i) and (ii) respectively: cooking salt, ≤3.5 and ≤4.0%; nitrite, ≤5 and ≤5 mg/100 g; moisture, ≤35 and ≤45% for local consumption and ≤42% for export outside boundaries of administrative region. Regulations on analysis, packaging, labelling, transport, storage and supplier's guarantee are listed. SKK

5 U 338
[Raw, cured pig-meat products.]
Union of Soviet Socialist Republics,
Gosudarstvennyi Komitet Standartov
Soviet Standard **GOST 16594-71** 11pp. (1971)
[Ru] [Moscow, USSR]

This standard covers 20 varieties of salted and smoke-dried pig-meat products. Standards on technological requirements, composition and organoleptic characteristics include the following, common to all varieties: moisture (when prescribed), ≤45%; nitrite, ≤5 mg/100 g; and, according to variety, cooking salt, 3.5-5.0%. Regulations on analysis, packaging, labelling, transport, storage and supplier's guarantee are listed. SKK

5 U 350
[Cold-smoked halibut: quality requirements for certified product.]
Union of Soviet Socialist Republics,
Gosudarstvennyi Komitet Standartov
Soviet Standard **GOST 5.1005-71** 4pp. (1971)
[Ru] [Moscow, USSR]

This standard covers cold-smoked North Atlantic halibut packaged in polyethylene film and awarded the state mark of quality. Standards on technological requirements, composition and organoleptic characteristics include: cooking salt in halibut flesh, 5-8%; halibut flesh moisture content, 40-58%; wt. of 1 specimen, 350-1000 g. Regulations on analysis, packaging, labelling, transport, storage and producer's guarantee are listed. Storage at from -2° to 2°C should be for ≤10 days and at from -4° to -8°C for ≤20 days. SKK

6 P 950
[Smoked cheese.]
Meiji Milk Products Co. Ltd.
Japanese Patent 662/72 (1972) [Ja]

Processed cheese is charged into a permeable membrane and subjected to a smoking liquor for 20-30 min. after which it is immersed in a paraffin wax bath of specific composition. IFT

6 S 678
[3,4-benzopyrene content of skinless frankfurters produced on a continuous line.]
Ruchkovskii, B. S.; Konstantinov, V. V.; Tiktin, M. A.; Morgulis, M. M.; Babanov, G. K.; Gorodiskaya, V. D.; Tkach, N. V.
Voprosy Pitaniya **31** (1) 74-77 (1972) [6 ref. Ru, en] [Kievskii Inst. Eksperimental'noi i Klinicheskoi Onkologii, Kiev, USSR]

In a new experimental continuous line for manufacturing skinless frankfurters, established at the Ukrainian Meat and Dairy Industries Institute in Kiev, frankfurter sausage meat is pressure-fed into fluoroplastics moultds in which it is coagulated by electrocontact heating by mains current (50 Hz, 127 V) for 45-50 sec during which temp. in the centre of a frankfurter reaches 70-72°C. The frankfurters pass then into a chamber where they are exposed for 14-15 min to a mixture of smoke and air at 100°C. The smoked frankfurters are washed with water for 30 sec, cooled with air at from -12° to -18°C and vacuum-packaged in 5-piece portions in polyethylene-cellophane film. Mean content of 3,4-benzopyrene of 9 samples of skinless frankfurters produced on this line was 0.0044 μg/kg vs. 0.59 μg/kg for 10 samples of 'Russian' cased frankfurters conventionally produced. Using a liquid smoke manufactured by the All-Union Meat Industry Research Institute, the mean 3,4-benzopyrene content of 10 skinless frankfurters was reduced to 0.0003 μg/kg. The advantages of the line over 2 named USA and W. Germany lines are pointed out. SKK

6 S 738
[Physico-chemical and bacteriological characteristics of half-smoked meat products packaged in aqueous-dispersion polymer packaging materials.]
Kotik, I. M.; Moiseenko, V. Sh.; Ludanova, N. V.; Gul', V. E.; Snezhko, A. G.; Dontsova, E. P.
Proceedings of the European Meeting of Meat Research Workers **16D**: 1067-1075 (1970) [8 ref. Ru]

A technology was developed for making packaging materials from an aqueous dispersion polymer base at room temp., the packages being formed on half-smoked meat products. physico-chemical and organoleptic characteristics of such products following 2-months storage at 10-15°C and 75-78% RH proved that the packages contributed to considerably reducing desiccation of the products and retaining satisfactory organoleptic characteristics. STI

6 S 748
[Application of the curing preparation of the Central Research Institute of Meat Industry in meat processing.]
Krylova, N. N.; Gorbatov, V. M.; Volovinskaya, V. P.; Khlamova, R. I.; Solov'eva, D. I.; Stoichez, M.; Gakev, A.
Proceedings of the European Meeting of Meat Research Workers **16D**: 1160-1168 (1970) [23 ref. Ru]

Tests were made to establish the desirable composition of smoking liquid, the amount necessary for production of smoked meat products and the effect on organoleptic characteristics of the finished product. The liquid developed by the Central Res. Inst. of Meat Ind. (VNIIMP) possesses a number of advantages as compared to smoke processing, especially as regards reduction of formaldehyde, tar and methanol content. The liquid produces no effect on the binding ability of raw materials. STI

7 E 312
[Smoking process.]
Suzuki, M.
Japanese Patent 4985/72 (1972) [Ja]

Smoking process in which water scrubbing is employed to remove carcinogenic compounds is described. IFT

7 R 312
[Method of smoking foods.]
Volodchenko, I. L. (Kuibyshevskii Ryboobrabatyvayushchii Zavod)
USSR Patent 322 171 (1971) [Ru]

Foods, e.g. fish, are smoked by predrying to a moisture content ≤60%. Then they are heated rapidly to 8-10°C higher than the predrying temp. before immediately undergoing a multiple, cyclyc immersion in smoking liquid, with a short drying period after each immersion. W&Co

7 R 325
Canadian northwest territories fish and mammal processing plant.

tz. A. W.; Iredale, D. G.
adian Institute of Food Technology Journal **5**
A15-A18 (1972) [En] [Fisheries Res. Board
anada, Freshwater Inst., Winnipeg 19,
itoba]
permanent cannery established at Rankin Inlet
operated by trained eskimos, is described.
ources available (fish and marine mammals) are
idered and formulas developed by the
hwater Institute for processing i.e. canning and
king char, trout and whitefish, are described.
G

329
**cessing effects on the texture of goldeye
odon alosoides).**
tz, A. W.; Iredale, D. G.; Vaisey, M.; York, R.
adian Institute of Food Technology Journal **5**
39-43 (1972) [13 ref. En, fr] [Fisheries Res.
rd of Canada, Freshwater Inst., Winnipeg,
itoba]
Despite years of smoke-treating goldeye (Hiodon
oides) processors still depend upon the skill and
erience of the smoke-house operators for
rable products. Experimental processing at the
hwater Institute shows that more acceptable
ked goldeye results from using fish that have
n frozen and thawed prior to brining and from
king at 32°C rather than 65°C. 10 selected
ges were instructed in scoring fish for
eptability, consistency, firmness and moistness.
sory evaluation with 9-point quality scales
wed that the texture of cooked hot-smoked fish
soft and mealy in contrast to the firmer, flakier
d-smoked product. Hot-smoked fish were also
r in the mouth. Freezing before processing
anced firmness, flakiness, moistness and
eptability. Acidification of brine made goldeye
ster and softer but had no effect on
eptability. The effects of pre-freezing were not
t enough to overcome the textural
dvantages caused by hot-smoking. AS

875
**tempt to establish optimal ripening time for raw
ed and smoked soft-textured sausages.]**
oszewski, Z.
czniki Instytutu Przemyslu Miesnego **8** (2) 33-
(1971) [50 ref. Pl, ru, en] [Inst. Przemyslu
snego, Warsaw, Poland]
aveloy-type sausages made from beef, pork and
k fat and filled into Cutisin protein casing of 65
diam. were ripened for 0-15 days at 15-16°C,
± 5% RH and air flow at 4 m/sec, smoked for 2
s at 22-23°C and 40-52% RH and stored for 40
s. Sausages were sampled periodically for
ermination of nitroso-pigments and total
nents in inner and outer layers by chemical tests
organoleptically and of moisture; 165 samples
e examined in all. Results and their statistical
uation are tabulated and discussed in detail.
sages smoked without ripening reached their
pigmentation after storage for ~10 days; they
had excellent taste and aroma, but their surface was too dark immediately after smoking, though it reached correct brown colour within 20 days. Sausages ripened for 1-4 days reached during ripening their highest nitrosomyoglobin content and maintained it to the end of the storage period. Finally, sausages ripened for >4 days showed pigmentation losses throughout storage. SKK

7 S 919
[Method for making sausage products.]
Kondrat, N. S.; Khazizov, N. N. (Krasnodarskii Myasakombinat)
USSR Patent 319 307 (1971) [Ru]

Sausage products, particularly of the hard smoked type, are manufactured by mincing meat and lard, and mixing them with spices and salt. This mixture is put into a casing, which is suspended and vibrated so that the sausage-meat settles and matures. It is then smoked and dried. Vibration is effected at 0-8°C for 18-24 h, at 50 Hz and an amplitude of 0.05-0.20 mm. Smoking is at 25-35°C for 1-2 days. W&Co

7 T 389
Smoked curing agents.
Fessmann, G.
British Patent 1 262 925 (1972) [En]

In a 2-stage process, superheated steam is first passed through particulate wood, after which the hot gaseous products are passed into a 2nd zone for further inter-reaction of the components; either of the steps takes places in an O_2-enriched atm. IFT

7 U 529
[Sausages and smoked products: preliminary batch evaluation and sampling.]
Poland, Polski Komitet Normalizacyjny
Polish Standard **PN-71/A-82105** 4pp. (1971) [Pl]

This standard replaces **PN-66/A-8205** and covers preliminary evaluation of a batch of sausages or smoked products and their sampling for physical, organoleptic, microbiological and chemical tests, as well as methods of interpretation of results of laboratory tests on a sample in terms of batch evaluation. Regulations on definitions, preliminary evaluation, preparation for sampling, sampling, documentation, packaging and despatch of samples for analysis are listed. SKK

8 E 340
[Optimum parameters for smoke production with friction generators.]
Dubinskii, V.
Myasnaya Industriya SSSR **42** (9) 7-10 (1971) [6 ref. Ru] [Bakinskoe Otdelenie Vses. Nauchno-issled. Inst. Myasnoi Promyshlennosti, Baku, USSR]

Quality, amount and cost of smoke produced by friction were studied in relation to generator design and rotor configuration. Parameters of the operation of the friction generator are described, i.e. pressure exerted on the wooden disk, speed of the rotor, smoking agent concn., consumption of wood with different rotor configurations. A nomogram is given to determine the smoke concn. with any preset parameters. STI

8 F 369

[Fundamental relations between packaging and microbial content of foods.] Grundsatzfragen über die Beziehungen zwischen Verpackung und Keimgehalt von Lebensmitteln.
Lubieniecki, M.
Alimenta **11** (2) 67-69 (1972) [De] [Inst. für Lebensmitteltech. und Verpackung, Munich, German Federal Republic]

The influence of packaging on contamination of foods may be direct, due to presence of microorganisms on packaging material, or indirect, due to permeability to air and water vapours. Both types of influence are illustrated, with examples; milk in Tetra-Pak and margarine in standard wrappers are quoted to illustrate the direct type of contamination, bakery products (in water-impermeable packs), fruit and vegetables (in water-permeable packs) and meat (in O_2-impermeable packs) the indirect. Vacuum-packaged foods susceptible to attack by anaerobic bacteria (e.g. smoked trout) must additionally be stored at <3°C. RM

8 G 382

[Science of food products (fats, meat, fish and concentrates).] Tovarovedenie prodovol'stvennykh tovarov (zhiry, myaso, ryba, kontsentraty). [A book]
Varibrus, V. I.; Bakzevich, D. D.; Zhuravleva, M. N.; Smol'skii, N. T.
567 pp. (1971) [Ru] Moscow, USSR: Izdatel'stvo Ekonomika. Price 1.26 roubles

This handbook comprises 4 parts, each dealing with physical and chemical properties, food value, packaging problems and storage. The individual parts cover the following topics: edible fats; composition and properties; oils of plant origin; rendered fats of animal origin; seafood and fish oils; hardened fats; margarine and shortenings; mayonnaise; eggs and egg products; meat and meat products; slaughter cattle; cattle slaughtering and processing; composition of meat and meat by-products; changes in meat after slaughtering; meat grading and classification; cold treatment and storage of meat and meat products; poultry meat; cured and smoked meat products; canned meat products; fish and fish products: morphology; chemical composition of fish; live fish; diseases of fish; processed fish and various ways of fish processing; seafoods; and food concentrates. STI

8 P 1157

[A method for the manufacture of smoked cheese using a smoking liquid.]
Lapshin, I. I.; Popova, A. S.
Molochnaya Promyshlennost' **33** (4) 12-16 (1972) [Ru] [Moskovskii Ordena Trudovogo Znameni Inst. Narodnogo Khozyaistva im G.V. Plekhanova, USSR]

The manufacture of smoked cheese of rod shape enclosed in a skin was studied and the following technique is recommended. The cheese is treated by immersion into a solution of a smoking compound (composition given) for 1-2 min, dried in hot air at 70-80°C for 20-30 min, cooled and coated with wax at 150-160°C, the whole process taking 1.5-2 h. The cheese had flavour typical of smoked cheese (made using smoke) and did not differ from it significantly in composition and phenol content. Economies attained in the processing time, reduced wt. losses due to drying and other advantages of the process are pointed out. FL

8 R 374

Factors in survival of Clostridium botulinum type E spores through the fish smoking process.
Alderman, G. G.; King, G. J.; Sugiyama, H.
Journal of Milk and Food Technology **35** (3) 163-166 (1972) [7 ref. En] [Food Res. Inst., Univ. of Wisconsin, Madison, 53706, USA]

Fish, experimentally inoculated with 1 × 10^6 Cl. botulinum type E spores, were given heat treatments equivalent to those used in commercial smoking (180°F for 30 min following come-up time of 2.5-3 h). The % of such fish containing viable type E spores were significantly lower among fish heated in an environment of high moisture than among those heated in atmospheres of low moisture. Type E spores heated in raw fish mince were more heat resistant than those heated in mince that was previously autoclaved. A similar difference was observed for spores in raw and cooked egg white, another substrate which coagulates rapidly at the temp. of thermal death time studies (82.5°C). Spores in the drippings of fish hung for heating survived heat processing and could be a source of cross contamination. AS

8 S 1000

[Effect of Bacillus cereus and Clostridium perfringens on organoleptic characteristics of meat products.]
Tsyss, E.; Perova, P.; Loginova, M.; Nichiporuk, V.; Pivovarov, Yu.; Akimov, A.; Pirogova, N. I.
Myasnaya Industriya SSSR **42** (8) 32-33 (1971) [13 ref. Ru] [Vses. Nauchno-issled. Inst. Myasnoi Promyshlennosti, USSR]

Changes in organoleptic characteristics of meat products (meat, minced meat, liver, boiled soft and non-perishable smoked meat products and canned meats) were related to storage temp., and to presence of Cl. perfringens and B. cereus. At relatively low storage temp. not even large amounts of these microorganisms affected the organoleptic characteristics. Storage temp. of ≥18-20°C induced spoilage in the products much more quickly, but the character of the changes in organoleptic properties was not sufficiently specific even when the microorganism concn. was high. STI

0
**intensification with vegetable protein
lysates.]** Geschmacksverstärker auf Basis
licher Eiweisshydrolysate.
pp, K.
trielle Obst- und Gemüseverwertung **56** (9)
43 (1971) [De]
mposition and properties of the following
protein hydrolysates (HPP) are discussed:
4BE (intensive beef taste, 1% meat extract =
4BE + 0.66% NaCl; HPP-3H1 (partially
orized used for light products such as veal),
3H3 (fully decolorized, suitable for fish), HPP-
slight smoked flavour); HPP-81, 81MY
ral meat taste suitable for various purposes);
-213, 245 (taste intensification of crustaceans);
RF-B (intensive roast beef flavour), HPP RF-
tensive roast chicken flavour). The mean
o acid composition of HPP is given (g amino
16 g N); main components are: glutamic acid
%), aspartic acid (9.5%), alanine (8.5%) and
ne (7.5%). The mean chemical analysis of the
rent HPP- products is tabulated: DM (96-98%),
43.00-51.10%), organic DM (46.40-55%), NaCl
20-41.70%), total N (5.37-7.13%), protein (33.60-
0%), ammonia N (0.49-3.40%), glutamic acid
3-16.60%) and pH (4.80-5.40). JMS

429
**lization of plastics materials and their effect on
quality of meat products.]**
on.
*dy, Vsesoyuznyi Nauchno-Issledovatel'skii
itut Myasnoi Promyshlennosti* **24**: 136-147
70) [Ru]
olyethylene film and cellophane were used to
meat cuts, and ensured a shelf-life of 2-3 days
-5°C and 85-87% RH. Packaging under vacuum
aired the appearance of the product due to
nage of liquid from meat, but enabled it to be
ed for 8-9 days under the same conditions.
tics packaging materials reduced weight losses,
retarded bacterial growth with the exception of
c acid bacteria. Mention is also made of long-
synthetic wrappers for packaging smoked
t products and of use of epoxy resins for anti-
osion coating of processing equipment. STI

1341
king machine.
rington, H. A.; Allen, W. M.; Kuhn, W. C.
trice Foods Co.)
ed States Patent 3 643 587 (1972) [En]
this process, cheese slices are passed
nuously through a smoke chamber in which
are subjected to treatment with nebulized
d smoke. The smoking machine may be
ted in the production line at a cheese factory.

385
nology of seafoods.] Technologia zywniosci pochodzenia morskiego. [A book]
Sikorski, Z. E.
574pp. (1971) [Numerous ref. Pl] Warsaw, Poland: Wydawnictwa Naukowo-techniczne. Price 100 zl.

This book contains the following chapters: Biological and technical basis for raw material supply; Chemical composition of major sea raw materials; Technological characteristics of seafoods; Preliminary mechanical treatment; Chilling and cold storage; Freezing and storage at low tem.; Fish curing; Smoking; Fish drying and protein concentrates manufacture; Manufacture of canned fish; Smoked fish production; Use of irradiation; Treatment of by-products; and Design and layout of fish plants. STI

9 S 1083
[Physical, chemical and bacteriological control in the meat industry.] Fiziko-khimicheskii i bakteriologicheskii kontrol' v myasnoi promyshlennosti. [A book]
Kogan, M. B.; Pozhariskaya, L. S.; Ryndina, B. P.; Freidlin, E. M.
462pp. (1971) [99 ref. Ru] Moscow, USSR: Izdatel'stvo Pishchevaya Promyshlennost'. Price 1.48 rouble

The book is divided into 4 parts containing the following chapters: Organization of laboratory work; Physical and chemical investigation methods; Microbiological methods; Investigation of meat; Investigation of sausages and smoked meat products; Convenience foods; Study of materials used in sausage production and convenience foods manufacture; Canned foods manufacture; Investigation of fats; Blood and bone glue products; Endocrinological raw material and products thereof; and Means of disinfection. STI

9 S 1098
[Measuring the consistency of meat products.]
Halvarson, H.
Livsmedelsteknik **13** (1) 22-23 (1971) [3 ref. Sv]
[Kottforskningsinst., Kavlinge, Sweden]

The method, designed paricularly for blended meat products, involves the use of Wolodkewitsch's apparatus [Zeitschrift für Lebensmittel-Untersuchung und -Forschung (1956) **103** (4) 261-272], which measures the resistance to pressure of a sample as it is forced through a narrow cylinder. The results are expressed as the force required to press the sample through, and the apparatus can be used in the 0.1-25.0 kg range. Tests on numerous samples (12-40) of 5 types of sausage and 1 firm and 1 spreadable liver paste showed SD of ±0.54-4.3 kg (±0.54-1.65 for all but a smoked sausage). The method is considered suitable for quality control of the consistency of meat products. HBr

9 S 1128
[Examination of some animals and animal products for salmonellae.]
Buczowski, Z.; Strzelecki, E.; Pietkiewicz, K.;

Cader-Strzelecka, B.
Medycyna Weterynaryjna **26** (8) 449-452 (1970) [Pl] [Krajowy Osrodek Salmonella, Inst. Med. Morskiej, Gdansk, Poland]

As a result of an agreement with the National Communicable Disease Centre in Atlanta, Georgia, USA, The Marine Medicine Institute of Gdansk carried out in 1965-1969 an investigation on salmonellae infections among farm and zoo animals and on salmonellae contimination of carcasses (lymph nodes, intestine, gall bladder) and of some animal products. The tabulated data include the following % figures for food product contamination with numbers of samples in parentheses: delicatessen, 11.4 (491); pickled meat products, 8.2 (413); cooking sausage, 7.1 (14); raw sausage, 2.2 (136); smoked raw sausage, 11.5 (69); minced meat, 5.1 (97); smoked products, 8.3 (12); Salmonella anatum predominated in these meat products. No salmonellae were detected in an unstated number of eggs or in 165 samples of dried milk. SKK

9 S 1141
[Application of ionization irradiation in meat industry.]
Anon.
Trudy, Vsesoyuznyi Nauchno-Issledovatel'skii Institut Myasnoi Promyshlennosti **24**: 173-175 (1970) [Ru]

Ionizing radiation, beside its bactericidal effect, adversely influences meat quality (impairment of taste, flavour, texture, non-typical colour and oxidation of fatty tissue); gamma radiation also impaired the action of antioxidants (butyl hydroxyanisole, butyl hydroxytoluene and the phenolic fraction of smoke). Irradiation of sausage products with 0.3 Mrad extended their storage life at room temp. threefold; thiamine losses were 20% following irradiation, and during storage there was a further twofold increase in the thiamine loss. STI

9 S 1147
Sausage smoking apparatus.
Simonsen, K.
Canadian Patent 898 591 (1972) [En]

Apparatus consists of a member for engaging and supporting a continuous length of linked sausages, and has an upper support rail and 2 lower spacer rails. The support rail carries the main portion of the wt. of the length of sausages, and the spacer rails keep individual loops of sausages apart. IFT

9 S 1177
[Study on general consumer concerns about meat processing products.]
Sung, S. K.; Rha, B. C.
Korean Journal of Animal Science **12** (4) 282-286 (1970) [Ko, en] [Orion Foods Co. Ltd., Seoul, Korea]

2000 questionnaires were sent to consumers, and 1215 answers were analysed. The results showed that 80% purchased sausages. 33% of housewives could not distinguish between meat and fish sausages, and 52.5% did not distinguish high quality products such as bacon, roast ham and boneless ham. 60% considered taste to be the most important quality criterion; 61.5% enjoyed smoke flavoured products. KoSFoST

9 T 502
Smoke concentrates.
Moller, H. G.
United States Patent 3 663 237 (1972) [En]

A method is described for prroducing aroma concentrates by smoking a meaty substance and then extracting with an organic solvent for the smoke flavour. Particular application is for concentrates with the odour and taste of smoked bacon and smoked ham. IFT

10 C 239
[Smoked foods and carcinogenesis.] [A review]
Lederer, J.
Cahiers de Nutrition et de Dietetique **7** (1) 23-26 (1972) [27 ref. Fr] [Ecole de Sante Publique, Univ. de Louvain, Belgium]

10 F 497
[Packaging film.]
Osake Chemical Alloy Co. Ltd.
Japanese Patent 7334/72 (1972) [Ja]

Polyvinylidene chloride packaging material for smoked foods has the outer surface printed by photogravure and the inner surface coloured. IFT

10 R 495
[Effects of freezing times and temperatures on vacuum packed smoked salmon.]
Declerck, D.; Vyncke, W.
Revue de l'Agriculture **25** (3) 481-491 (1972) [10 ref. Fr, en]

In a study of the effect of freezing and frozen storage on vacuum packed smoked salmon the fish was prepared by cleaning, pickling, smoking and drying. It was then divided into 150 g portions and vacuum packed in nylon 11. The packs were either: (i) stored at 0°C; (ii) frozen at -28°C (45 min) and then stored at -28°C; (iii) frozen at -28°C for 45 min and then stored at -18°C; or (iv) frozen at -28°C for 12 h and stored at -28°C or -18°C. After 5-7 days (i) was examined for total bacteria, volatile basic N and thiobarbituric acid and (ii)-(iv) were examined over 5 wk for thiobarbituric acid content, peroxide number, free fatty acid content and organoleptic qualities. Results showed that the shelf-life of (i) was ~2 wk, that those samples stored at -28°C had a shelf life of 5 months and those stored at -18°C had a shelf life of 3 months. If the freezing rate was too rapid the salmon colour was effected but the faster the freezing rate the lower the peroxide number and the greater the amount of thiobarbituric acid evolved. LA

ı5
s on the flavour of "katsuobushi". IV.
ons in phenolic compounds during
ing.]
ori, K.; Okamoto, K.
n of the Japanese Society of Scientific
***es [Nihon Suisan Gakkai-shi]* 37** (7) 610-
971) [3 ref. Ja, en]
ations in the phenol and non-carbonyl
fractions of "katsuobushi" flavour during
ing were studied gas-chromatographically.
nols were found in fresh skipjack meat, but
er of phenols were detected in "katsuobushi"
s. The phenols gradually increased in
r and amount during the wood-smoking
out were largerly unchanged by the moulding
s. >10 non-carbonyl neutral compounds were
d in fresh skipjack meat. Their content in
bushi" samples was unchanged during wood-
g and only a slight change occurred during
ng. AS

254
yclic hydrocarbons in Yugoslav smoked meat
ts.] Polycyclische Kohlenwasserstoffe in
herten jugoslawischen Fleischwaren.
ic, J.; Toth, L.
***wirtschaft* 51** (9) 1323-1325 (1971) [10
e, en, fr] [Inst. for Food Tech., Novi Sad,
avia]
amples of Yugoslav smoked sausages and
roducts contained 14 identified and 4-5
tified polycyclic hydrocarbons (PHC),
ing 0.2-2.9 ppb (parts/billion) 3,4-
yrene, which was the only strong carcinogen
t. Mean 3,4-benzpyrene concn. was 0.8 ppb.
ples contained >1 ppb. The highest concn.
pb) was found in one samples of "Sremer"
e. Casings of natural gut allowed 70-80%, and
se or synthetic casings ~30% of PHC to
into the sausage. "Tee-Pak" casings allowed
13% of the 3,4-benzpyrene, 29% of parene and
f fluoranthene to diffuse. Experimental cold-
t-smoked sausages in "Natron" or "Tee-Pak"
s showed that both types were equally
able for 3,4-benzpyrene, pyrene,
nthene and 3,4-fluoranthene. ~30-40% more
was absorbed during hot than cold smoking
vs. 6.75 ppb) with 30-50% more in finely than
rsely ground meat. Smoked flavour was about
me after 2 h hot or 42 h cold smoking. RM

1259
influence of scalded sausage ("Brühwurst")
facture on certain antibiotics.]
suchungen über die Beeinflussung
iedener Antibiotika durch die Brühwurst-
ellungstechnologie.
bner, G.
***tshefte für Veterinärmedizin* 27** (5) 161-164
) [9 ref. De, en, ru] [Sekt. Tierproduktion
eterinärmedizin, Humboldt-Univ. zu Berlin,
tuhl für Lebensmittelhygiene, German
Democratic Republic]

The effects of smoking and scalding processes used in the production of scalding sausage (Brühwurst) on residues of penicillin, tetracycline and streptomycin were studied. Partial inactivation was found in all scalded sausage products; residual activities as % of antibiotic added were for penicillin 17-48, tetracycline 25-28 and streptomycin 32-45 (agar diffusion technique). Inactivation was due partly to smoking and partly to the scalding temp. and varied to some extent the type of sausage and associated process. IN

10 S 1271
[Polycyclic hydrocarbons in smoked ham and belly fat.] Polycyclische Kohlenwasserstoffe in geräuchertem Schinken und Bauchspeck.
Toth, L.
***Fleischwirtschaft* 51** (7) 1069-1070 (1971) [4 ref. De, en, fr] [Bundesanstalt für Fleischforschung, 8650 Kulmbach/Bay., Blaich 4, German Federal Republic]

10 samples of variously smoked ham and belly fat were examined for 3,4-benzpyrene, pyrene and fluoranthene by rapid in-situ fluorometric method [J. Chromatog. (1970) **50**: 72-82]; results are tabulated. Most samples contained <1µg/kg 3,4-benzpyrene, though one contained 13-8 and 2 others 3.8 and 3.9 µg/kg respectively. The compounds occurred chiefly in the outermost layer, with >95% at a depth of ≤1 cm. Other polycyclic hydrocarbons: pyrene, anthracene, fluoranthene, chrysene, 1,2-benzanthracene, 3,4-benzfluoranthene, perylene, 1,2-benzpyrene, 1,12-benzperylene, coronene, 1,2,5,6-dibenzanthracene occurred in a fairly constant proportion to 3,4-benzpyrene. The available data did not allow assessment of the influence of smoking procedure on production of carcinogens. RM

10 S 1349
[Effect of additives on technology and quality of meat products.] Hilfs- und Zusatzstoffe und ihr Einfluss auf Technologie und Qualität von Fleischwaren.
Wyler, O.
***Fleischwirtschaft* 52** (6) 727-731 (1972) [De] [CH 3028, Spiegel bei Bern, Erlenweg 8, Switzerland]

The effects and applications of the most important food additives are discussed, including: NaCl, NO_3^-, NO_2^-, SO_2, glucono-δ-lactone, starter cultures, spices and spice extracts, smoke aroma, glutamate, ribonucleotides, water and ice, blood plasma, condensed acid polyphosphates, skim-milk powder, antioxidants, thickening agents and environmental residues e.g. disinfectants, pesticides, antibiotics, hormones, heavy metals. The effect of 24 additives or residues are presented in tabular form. RM

10 S 1354
[Installations for continuous smoking and cooking

of frankfurter type sausages.] Anlagen zum kontinuierlichen Räuchern und Garen von Brühwürsten.
Tändler, K.
***Fleischwirtschaft* 52** (2) 159-160 (1972) [De] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, German Federal Republic]

The 2 recently developed W. German conveyor systems, the Fessmann Transfer 4000 (Wilhelm Fessmann, 7057 Winnenden-Birkmannsweiler) and the Autotherm Konti-Tunnel (Ludwig Brümmendorf, 5523 Waxweiler) are described and illustrated. RM

10 S 1381
[The problem of residues from the environment in meat.] Zum Problem umweltbedingter Rückstände in Fleisch.
Mirna, A.
***Fleischwirtschaft* 52** (3) 321-324 & 327 (1972) [59 ref. De, en, fr] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Blaich 4, German Federal Republic]

The health hazards due to contamination of meat, meat products and fish with residues of stable or radioactive Pb, Hg, chlorinated pesticides and reaction products from NO_3 or NO_2 (especially nitrosamines) and N oxides (NO and NO_2) from gases produced during smoking of foods are discussed. RM

10 S 1408
Smoked link sausages.
Podebradsky, E. V. (Oscar Mayer & Co. Inc.)
United States Patent 3 672 913 (1972) [En]

Addition of mono- or di-saccharides to the liquid smoke used in the manufacture of link sausage products facilitates machine peeling of skins and minimizes the development of undesirable flavours or brown colour. IFT

11 S 1484
The effect of sodium nitrite on the flavour of frankfurters.
Wasserman, A. E.; Talley, F.
***Journal of Food Science* 37** (4) 536-538 (1972) [8 ref. En] [USDA, E. Regional Res. Lab., E. Marketing & Nutr. Res. Div., Philadelphia, Pennsylvania 19118, USA]

The characteristic flavour of frankfurters was produced by incorporating sodium nitrite in the cure. Differences in flavour between frankfurters cured with or without sodium nitrite were readily detectable by the triangle test procedure. The presence of smoke did not interfere greatly with the ability of the judges to distinguish between the treatments. In a scoring test procedure, however, smoke significantly affected the flavour of the frankfurters and little difference was observed as a result of the presence of nitrite. IFT

12 A 546
Nutrition - a new dimension in food processing.
Rubin, L. J.
***Food in Canada* 32** (5) 23-27 (1972) [En] [Res. Dept., Canada Packers Ltd., 2200 St. Clair Ave. W., Toronto 9, Ontario, Canada]

Effect of cooking, curing, smoking, canning etc. on the general nutritional quality, proteins, amino acids, vitamins and minerals of meat is considered. Quality of protein present in cheap meat products such as luncheon meat, Wieners and Bologna is examined. It is shown that the nutritional value of meat and meat products is reasonably well preserved during processing and that even the cheaper meat products are a good nutritional buy. The growth of snack eating is noted, and it is suggested that guidelines be established to allow the consumer a better chance of selecting an adequate diet from the 12 000 food products now available. It is felt that if a protein standard is set for meat products some consideration should also be given to protein quality. Nutritional standards should be set for convenience meals. PG

12 C 293
Nitrite, nitrosamines and cancer.
Aune, T.
***Nordisk Veterinaermedicin* 24** (7/8) 356-369 (1972) [47 ref. En, no] [Dept. of Pathology, Sentralsykehuset i Trondheim, Norway]

The presence of nitrite in different groups of food, i.e. milk, fresh meat, flour, bread and baked products, fresh and canned vegetables and fruit, frozen vegetables, cheese, fresh and canned fish, smoked fish, sausages and ham, is detailed and discussed. Results are given of a survey of nitrite in various meat products in Norway. Concn. appeared to be relatively high, average levels of nitrite (ppm) being for salami (mutton) 73.6, salami (lux) 20.3, salami (gold) 33.0, luncheon meat 76.0, liver-pate 20.0, gammon 22.0, sausages (hot dogs) 14.5, bacon 13.0, and smoked salmon 130.0. The possibility of synthesis of carcinogenic nitrosamines in man from nitrite intake is discussed and it is recommended that the use of nitrite as an additive to food ought to be reduced or completely prohibited. The Norwegian Health Department has recently announced the withdrawal of nitrate and nitrite from the market as additives to food. From Jan. 1st 1973 these chemicals will only be allowed on special permission. AA

12 R 669
[Fish product.]
Unilever NV
Netherlands Patent Application 7 111 727 (1972) [Nl]

Uniform portions of smoked fish, each consisting of small pieces adhering to each other, are produced by: treating raw, preferably filleted fish with a salt (NaCl or an edible phosphate) until the salt content is 0.5 - 12.0% by wet wt.; forming and freezing portions; and exposing the frozen portions to wood smoke. The temp. of the fish during smoking (hot or cold) is preferably not above -8°C. The cohesion of the fish pieces is probably caused by the sticky exudate formed by muscle proteins dissolved in the brine. The method is suitable for

addock, halibut, herring and other members
Clupeidae and Gagidae. For top quality
cts, blood-stained or otherwise discoloured
ould be removed. W&Co

671
od of soaking salted fish.]
erg, V. M.
Patent 340 390 (1972) [Ru]
, e.g. herring, is threaded on a rod for
ng and is sprayed with water at periodic
als to effect salt equilibrium. Spraying time is
ably 2-4 h and the interval 1-2 h. After 1-2 h
ng, the fish heads are covered. W&Co

675
s of dressing and cooking on DDT
ntrations in certain fish from Lake Michigan.
rt, R. E.; Stewart, D.; Seagran, H. L.
al of the Fisheries Research Board of Canada
) 525-529 (1972) [3 ref. En, fr] [US Fish &
ife Service, Great Lakes Fishery Lab., Ann
r, Michigan 48107, USA]
ncn. of DDT residues were highest in parts of
ody with the highest oil content in 4 spp. of
rom Lake Michigan: yellow perch (Perca
cens), bloater (Coregonus hoyi), lake trout
elinus namaycush), and coho salmon
orhynchus kisutch). Dressing reduced the
residues and oil content by >90% in yellow
but had little effect in the other 3 spp. Concn.
DT residues in bloaters was changed little by
ing but was reduced 64-72% by other methods
oking: from 8.0 ppm (raw) to 2.2 ppm after
g in corn oil; from 10.7 to 3.9 ppm after frying
d; and from 9.1 to 3.2 ppm after broiling.
n. of DDT residues in fillets of yellow perch
ged only from 0.3 ppm (raw) to 0.4 or 0.5 ppm
baking, frying or boiling. AS

686
nology of fish products.] Tekhnologiya
kh produktov. [A book]
v, V. P.
p. (1971) [18 ref. Ru] Moscow, USSR:
el'stvo "Pishchevaya promyshlennost". Price 53

e book contains the following chapters: fish as
naterial; live fish supply; treatment of raw fish
rial; cooling of fish; fish curing; caviare
rvation; fish drying; fish smoking; manufacture
ned fish products; feedingstuffs manufacture
production of technical products from fish; sea
mals processing; medical fats and oils
facture and production of vitamin
rations; crab processing; packaging and other
iary materials; principals of processing control.

689
e-smoking of fish.
a.
Technology in Australia **24** (6) 347-348
(1972) [En]

A method for preparing and smoking of fish is described, including details of cleaning, curing, drying and smoking. Australian species suggested as suitable for smoking include yellowtail, snoek (barracouta), Australian salmon, mullet, Spanish mackerel and ruff. AA

12 R 692
[Device for automatic control of losses during smoking.]
Shkarin, A. S.
Rybnoe Khozyaistvo **47** (11) 61-62 (1971) [Ru] [NIKIMRP, USSR]

During smoking, fish lose water, solid substances, nitrates, fat, etc. The process can be controlled by maintaining the technological losses within a range from 25 to 35% of the weight of the raw material. A device was designed for the automatic control of losses during smoking, which indicates the time when predetermined losses are reached, continuously monitors the weight of the smoked raw material, and determines the standards for technological losses under optimum conditions. The principle of the operation and the fundamental technical data are given. STI

12 R 708
Evaluates smoke flavour for less used fish.
Paparella, M. W.; Tatro, M. C.
Food Engineering **44** (5) 109 (1972) [En] [Seafood Processing Lab., Univ. of Maryland, Crisfield, USA]

Boned, brined, and cooked white perch were: (i) canned in smoke-flavoured vegetable oil (SVO) or (ii) marinated in SVO for 48 h at 35-40°F, drained, canned without SVO and stored at -10°F. Taste tests revealed good acceptance of both (i) and (ii). WHCA

12 S 1572
[Method for production of sausages.]
Sarbaev, M. I.; Emets, A. V.; Firger, I. L.; Goncharuk, L. S.; Botvinov, V. S. (Kievskii Ordena Lenina Myasokombinat)
USSR Patent 334 971 (1972) [Ru]

Semi-smoked sausages are made by finely dividing the starting material, mixing in spices, filling into the casing, and heat- treating with a smoke-air mixture. The colour of fried products is imparted by spraying the sausages before heat-treatment with a solution of salt and sugar, preferably containing 25 - 30% sugar and 2% table salt in either water of blood serum. Heat treatment is preferably carried out by heating first at 80 - 90°C for 2 h, then at 110°C for 1 h. W&Co

12 S 1587
[Water losses of portioned veal and pork, smoked poultry, poultry loaves and salami during storage in shops.]
Dinev, V.
Khranitelna Promishlenost **19** (9) 30-31 (1970)

[Bg, en, fr, de, ru]

Water losses were due to the preparation of the meat under unsatisfactory temp. conditions and transport to shops in an uncooled condition. Higher losses were found when the meat was stored in shop windows at 8-14 instead of 0-4°C. Smoked chicken stored in shops at 14°C changed in appearance, colour and taste after 3 days; the loss of water amounted to 19.96%. At this storage temp. other products behaved in the same way. Storage in shops requires temp. of 1-4°C. Acceptable values of water loss during selling were proposed which would not affect the quality of the products. STI

12 S 1592
[Smoke generation using superheated steam.]
Raucherzeugung durch überhitzten Dampf.
Reuter, H.
Fleischerei **23** (7) 9-10 (1972) [6 ref. De, en, fr] [Bundesanstalt für Fleischforschung, Kulmbach, German Federal Republic]

An apparatus for smoking sausages and meat products is described (with a functional diagram), in which wood is heated with superheated steam to produce a smoke-steam mixture. It is pointed out that pyrolysis of wood is optimal at 400°C, but oxidation by the air supply can occur at 200°C; the most suitable temp. therefore lies between 300°C and 400°C, since at higher temp. water-insoluble products are produced, including known carcinogens. The steam treatment greatly reduces the content of 3,4-benzpyrene in compariosn with conventional methods of smoke production. Experiments are described involving the use of smoke-steam mixtures at inlet temp. of 280-380°C, with a smoke penetration time of 6 min. The best product flavour and aroma was obtained at 340°C. ELC

12 S 1605
[Commercial production of semi-preserved boiling sausages (Brühwurst) in peelable skin.]
Industriemässige Produktion von Brühwurst-Halbkonserven im Schäldarm.
Klein, O.; Erdmann, W.
Fleisch **25** (12) 262-264 (1971) [De] [VEB Halberstädter Fleisch- & Wurstwarenwerke, German Democratic Republic]

Production of peelable semi-preserved boiling sausages at the Halberstadt Meat & Sausage Factory is in the following stages: comminution of the meat and grading; preparation of the filling; emulsification; filling and portioning; smoking; packaging; sterilization; and final processing. A continuous cold-chain network up to the retail outlet and the maintenance of prescribed storage temp. are essential. IN

12 S 1641
[Use of liquid smoke preparations in the manufacture of meat products and sausages. I.]
Anwendung von Räucherflüssigkeit bei der Herstellung von Fleisch- und Wurstwaren. I.
Krüger, H.
Fleisch **24** (11) 285-289 (1970) [De] [Inst. für Fleischwirtschaft, Magdeburg, German Democratic Republic]

4 methods of using smoke condensates in the manufacture of meat products and sausages are discussed: spraying of the liquid in a heated chamber; dipping of the skins into the preparation; dipping of the finished sausage into the preparation; admixture of the condensate in the raw material. Analytical and organoleptic tests are also described. Liquid smoke preparations can be used with particular success in the manufacture of Kochwurst (sausage made from cooked ingredients) because the skins are made from material (Perfol, viscose) with a low permeability to the components of the liquid smoke preparations. IN

12 S 1642
[Use of liquid smoke preparations in the manufacture of meat products and sausages. II.]
Anwendung von Räucherflüssigkeit bei der Herstellung von Fleisch- und Wurstwaren. II.
Krüger, H.
Fleisch **24** (12) 318-322 (1970) [41 ref. De]

The use of Hungarian and Soviet liquid smoke preparations in the manufacture of various types of sausage, minced meat, meat salad components and ham was investigated. The former were unsatisfactory while the latter were fair to good. Excessive concn. of the preparations gave a phenolic flavour to the product. Need for analytical methods of determination is emphasized. [See also preceding abstr.] IN

12 S 1652
[Softening of canned sausages.] Zum Weichwerden von Dosenwürstchen.
Lat, J.
Fleisch **24** (12) 316-317 (1970) [De] [Forschungsinst. für Fleischwirtschaft, Brno, Czechoslovakia]

Although canned sausages are only semi-preserved products, they are frequently stored at unsuitable temp., and thereby develop various defects, in particular, softening. This is usually caused by sporeforming bacteria. Smoking (as opposed to cooking) has a distinct bactericidal or bacteriostatic effect, which retards the onset of softening, especially in the case of skinless varieties. Smoking also makes the skins brine-resistant and prevents their splitting. IN

12 S 1682
[Techniques in cooking and smoking.] Die Verfahrenstechnik beim Kochen und Räuchern.
Anon.
Fleischerei **23** (4) 49, 52 & 55 (1972) [De, en, fr]

The rapid development of meat cooking and smoking installations from 1967 to 1970 is briefly reviewed, and presently available equipment is discussed: cooking vessels and chambers, smoking

hermal lift and circulation equipment,
ined cooking/smoking equipment, climatic
moking and sausage ripening equipment,
e generators with silo for wood chips and
ıst, condensate smoke generators and friction
e generators. OA

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FOOD ANNOTATED BIBLIOGRAPHIES

Selected abstracts from Food Science and Technology Abstracts on important specialized aspects of food science and technology are now available as Food Annotated Bibliographies (FABs).

The FABs already completed are listed below, and further FABs are in preparation. Suggestions are welcomed for specific topics for additional bibliographies.

FAB	Title	No. Ref.	Price	Vol. 1-3	No. Ref.	Price	Vol. 4	Vol. 5 (1973) Monthly (12 issues)	
1.	Application of Reverse Osmosis to Food Processing	104	£2.00	☐	58	£2.00	☐	£4.00	☐
2.	New Sources of Food Protein	662	£6.00	☐	332	£3.50	☐	£9.00	☐
3.	Natural and Synthetic Sweeteners	338	£3.50	☐	198	£2.00	☐	£6.00	☐
4.	Techniques for Analysis of Flavour Volatiles	367	£4.00	* ☐	237	£2.50	☐	£7.00	☐
5.	Microwaves in Food Processing	160	£2.00	☐	103	£2.00	☐	£5.00	☐
6.	Texture Analysis of Foods	426	£4.50	* ☐	429	£4.50	☐	£11.00	☐
7.	Synthetic Dairy Products	150	£2.00	☐	88	£2.00	☐	£4.00	☐
8.	Acidulants in Foods	413	£4.50	☐	200	£2.50	☐	£7.00	☐
9.	Agglomeration of Powders	73	£2.00	☐	34	£2.00	☐	£4.00	☐
10.	Aseptic Packaging	131	£2.00	☐	79	£2.00	☐	£4.00	☐
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J. NEWTON
ASSISTANT EDITOR

1 A 31

Gas chromatographic determination of volatile nitrosamines in foods.

Essigmann, J. M.; Issenberg, P.

Journal of Food Science 37 (5) 684-688 (1972) [11 ref. En] [Dept. of Nutr. & Food Sci., Massachusetts Inst. of Tech., Cambridge, 02139, USA]

Methods are presented for determination of certain volatile nitrosamines which have been reported to occur in foods. Nitrosamines were removed from foods using a Likens-Nickerson extractor; 60% of added dimethylnitrosamine and 70% of added diethylnitrosamine were recovered from 10 ng/g aqueous solutions. Potential gas chromatographic (GC) interferences were removed from the extract by a simple acid extraction step and, when needed, by liquid column chromatography. Dilute solutions containing nitrosamines were analyzed directly with a GC solvent stripping technique. Nitrosamines were detected with a Coulson electrolytic conductivity detector operated in the pyrolytic mode and with a flame ionization detector. Sensitivities of these detectors are compared for selected volatile alkyl and heterocyclic nitrosamines of potential significance in foods. The specificity of the Coulson detector is demonstrated for analysis of extracts of smoked fish and a number of processed meats. Additional clean-up of concentrates from foods is required to insure unambiguous identification of nitrosamines by combined GC-mass spectrometry. IFT

---

1 F 11

[Does O_2-free packaging encourage botulism?] Kann Botulismus durch sauerstoffarme Verpackung begünstigt werden?

Lubieniecki-von-Schelhorn, M.

Fleischwirtschaft 50 (10) 1365-1367 (1970) [23 ref. De, en, fr] [Inst. für Lebensmitteltech. & Verpackung eV, 8000 Munich 50, Schragenhofstrasse 35, German Federal Republic]

Available evidence on the effect of vacuum packaging on development of Clostridium botulinum is critically examined. On suitable substrates, botulin formation occurred irrespective of presence or exclusion of O_2. The results are explained by the fact that low redox potential required for growth of Cl. botulinum persisted in the interior of the food. Incidence of botulism after consumption of vacuum-packaged smoked fish was attributed to neglect of hygienic precautions and to high storage temp. At storage temp. <3°C vacuum packaging is considered safe, provided hygienic precautions are observed. RM

---

1 S 16

[On the fat/protein ratio in cut smoked sausage.] Über das Fett/Eiweiss-Verhältnis bei schnittfesten Rohwürsten.

Bertling, -.

Fleischwirtschaft 50 (5) 581-582 (1970) [6 ref. De]

Published work on fat:protein ratio in cut smoked sausages is discussed with a view to setting a limiting value. From values found in commercial Cervelat, Salami, Plockwurst and Mettwurst an 80% limit of max. 3.3 is proposed. RM

---

1 S 55

[Method for manufacturing dry sausages.]

Unilever NV

Netherlands Patent Application 7 200 298 (1972) [Nl]

Small, skinless, dry sausages having a round cross-section, a wt. of 5-25 g, a length of 3-15 cm and a water content of <24% by wt. are made from raw meat, salt and spices. The mixture is filled into sausage casings in which it is smoked and dried. After removal of the casings, the sausages are exposed for 2 h-15 min at 20-25°C to an atm. of 90-100% RH. The sausages are subsequently packaged in airtight polyethylene/Al foil/cellophane bags containing a N_2 atmosphere, or in partly evacuated cans. W&Co

---

1 S 56

[A new protective film for smoked sausage.] Ein neuer Schutzfilm besonderer Art für Rohwurst.

Bartels, H.

Fleischwirtschaft 50 (5) 570-572 (1970) [De] [Inst. für Tierärztliche Nahrungsmittelkunde, 6300 Giessen, Frankfurter Strasse 94, Postfach 201, Federal Republic of Germany]

Skintex, a newly developed protective skin for smoked sausages was tested on commercially produced cervelat sausages in natural and artificial skins. Sausages were cold-smoked for 6 days, matured for 12 days, dipped in Skintex at 120-130°C and stored 30 days at 18°C (14-22°C) and 47% RH (34-61%). Mean wt. loss of Skintex-dipped and undipped product (9 samples for each treatment) was: in natural skin 7.4 and 13.2%; in artificial skin 5.9 and 11.0%. Surface drying of product was avoided, colour, flavour and consistency were better and peeling was easier in dipped product. pH and bacteriological count were not affected. The skin increased wt. by approx. 1%. RM

1 S 126
Sensory properties of phenolic compounds isolated from curing smoke as influenced by its generation parameters.
Daun, H.
1072bd 5 (3) 102-105 (1972) [8 ref. En] [Dept. of Food Sci., Rutgers St. Univ., New Brunswick, New Jersey 08903, USA]

In a study of phenolic substances isolated from curing smoke, smoke samples were produced from beechwood under different conditions and the particle and gas-vapour phases collected. Phenolics were isolated from both phases by gas chromatography, diluted with water to give a series of samples and evaluated for sensory properties using a panel to indicate at what concn. the smoke-cured flavour became apparent and at what concn. it was most desirable. The recognition threshold varied according to the smoke generation parameters and according to the phase from which the phenolics were extracted; the threshold was higher for odour than taste because the headspace of the water solution was used for this test. Vienna sausages with added phenolics were also evaluated. Phenols with short elution times were mostly found in the gas vapour phase and those with the middle- and long-elution times mostly in the particle phase but they could not be identified at that stage. The smoke generation parameters significantly influenced the % of individual phenols and the best parameters were thought to be pyrolysis temp. 500°C, oxidation temp. 200°C, air supply 1500 l./h and amount of wood 50 g. LA

1 U 82
[Babek (dried smoked sausage).]
Bulgaria, Komitet po Kachestvoto,
Standartizatsiyata i Metrologiyata
***Bulgarian Standard* BDS 9179-71** 3pp. (1971) [Bg]

Babek, a sausage made from boneless pork, shall contain 32-38% moisture, 55-65% fat in DM, 2.5-4.0% cooking salt, and ≤10 mg nitrites/100 g; there is no tolerance for coliforms or Proteus spp. (/0.1 g) or pathogens. The standard also covers testing, packaging, storage and transport. HBr

2 D 100
Fisheries of the Netherlands.
Glen, D.
Fishing News International **11** (10) 24-26, 29, 30, 32, 35 (1972) [En]

The Dutch fish industry is discussed with reference to the decline in the total quantity of fresh, salted and frozen herring for human consumption, from 136 000 tons in 1961 to 42 700 tons in 1971 ; however cod increased from 19 000 to 37 000 and sole from 14 500 to 17 400 tons, in 1970 and 1971 respectively. Fish in the Netherlands in 1971 was utilized and marketed as follows : 71% fresh or frozen ; 21% cured (salted, smoked, dried) ; 6% canned ; 1% meal/oil , and 1% for other uses. AA

2 R 98
Decline in herring hits canners.
Anon.
Fishing News International **11** (10) 42 (1972) [En]

The decline in North Sea stocks of mackerel and herring and the subsequent demand for fresh fish have pushed prices out of the reach of the canners who buy at periods of abundant supply and low prices. In 1971: 17 000 tons (about 6% of total landings) were canned; 62 000 tons (21%) were semi-preserved by smoking, salting and drying; 4700 tons (1%) were converted to fish meal and oil; and 210 000 tons (71%) were marketed either fresh or frozen, an increase of 23 000 tons on the previous year. Freezing of fish, and production of various herring products, including maatjes and bokking, by salting, curing and marinating, are described. AA

2 R 107
Nordsee - an industry in one company.
Hawley, D.
Fishing News International **11** (11) 37-38 (1972) [En]

The history and present status of the "Nordsee" Deutsche Hochseefischerei GmbH are presented, with particular emphasis on the Fischindustrie Bremerhaven, where fresh, frozen and smoked fish and canned, bottled and marinated products are produced. JN

2 S 156
[The smoking of meat products.] Die Räucherung von Fleischerzeugnissen.
Reuter, H.
Fleischwirtschaft **52** (9) 1116-1118, 1121 (1972) [6 ref. De, en, fr] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

Methods of smoking are described including cold-, warm- and hot-smoking. Details are given of the various processes including subsequent maturation. RM

2 S 157
[The effect of smoking technology on the content of carcinogenic hydrocarbons in smoked meat products. I. Effect of various smoking methods.]
Einfluss der Räuchertechnologie auf den Gehalt von geräucherten Fleischwaren an cancerogenen Kohlenwasserstoffen. I. Einfluss verschiedener Räucherverfahren.
Toth, L.; Blaas, W.
Fleischwirtschaft **52** (9) 1121-1124 (1972) [18 ref. De, en, fr] [Bundesgesundheitsamt, 1000 Berlin 33, Unter den Eichen 82-84, Federal Republic of Germany]

3,4-Benzpyrene concn. of meat products cold-smoked by traditional slow method (2-6 wk) or by rapid cold smoking, hot smoked or black smoked was examined. Mean benzpyrene contents were (parts/billion): traditionally cold smoked products 0.6 (one sample 1.6); rapidly cold smoked products 0.7 (2 samples 1.4 and 2.9); hot smoked 0.40 (one sample 1.10). Values >1 ppb were found in 10% of samples. Black smoked products varied widely from 0.3 to 55.0 ppb, with 7 samples >1 ppb and 4 <1 ppb. Total quantity of carcinogenic polycyclic hydrocarbons in smoked meats was 5-10 times the amount of 3,4-benzpyrene. A provisional limit of 1 ppb 3,4-benzpyrene in the edible portion of smoked meats is recommended. This requirement is technologically defensible and would automatically exclude insuitable smoking methods. RM

2 S 230
Controls of Clostridium botulinum and Staphylococcus aureus in semi-preserved meat products. [Review].
Riemann, H.; Lee, W. H.; Genigeorgis, C.
Journal of Milk and Food Technology **35** (9) 514-523 (1972) [106 ref. En] [Dept. of Epidemiology and Preventive Med., School of Vet. Med., Univ. of California, Davis, 95616, USA]

The prevalence of Cl. botulinum and Staph. aureus in packaged, moist, meat products cured with 1-7% salt and pasteurized at <100°C is discussed. The effects of temperature, pH, brine concentration, wood smoke, packaging, and glucose are reviewed. JN

2 S 233
[Changes in manufacturing methods of "Gyulai" and "Csabai" dry sausages with special regard to smoking.]
Zam, A.
Husipar **21** (5) 219-221 (1972) [Hu, ru, en, de]

Changes in manufacturing methods influenced the whole production of "Gyulai" and "Csabai" sausages. Boning, cooling, filling, pairing, smoking, ripening and packaging have experienced considerable development. Changes included an improvement of smoking, the oldest traditional phase of production. In the conditioned smokers firing logs of wood has been replaced by smoke generators. As a result a capacity increase of 50%, undisturbed production, consistent quality and elimination of unwholesome techniques have been achieved. AS

2 S 234
[New pork product.]
Ammeter, A.
French Patent 2 102 651 (1972) [Fr]

A snack comprises a precooked pork sausage emulsion filled into a casing formed from sheep's intestine. Some at least of the emulsion constituents may be smoked before cooking and the casing is artificially coloured. The sausages each weigh approx. 30 g. are 3 cm long, and may be separate or in a string. W&Co

2 T 60
[Conditioning of smoking smoke.]
Proskura, Yu. D.
Rybnoe Khozyaistvo **47** (10) 55-57 (1971) [Ru] [TINRO, USSR]

Smoking smoke is an aerosol composed of a dispersive phase and small colloidal particles in the form of drops. The basis for the formation of the dispersive phase is the condensation of water vapour when smoke is turbulently mixed with air. This process is expressed by equations describing the conditions of generation of the dispersive phase. The generation of the dispersive phase is affected by the water content of the wood, the air excess coeff. during burning, the temp. of the smoke at the input to the mixing chamber, and the mixing ratio of the smoke and air. For smoking in a high voltage electrostatic field the oversaturation of the water vapour must be >1; it is therefore more convenient to use wood with a higher water content >30%), to burn it without excess of air, and to decrease the temp. of the smoke for mixing. For current smoking drier wood is more suitable (<20%) as well as an excess of air (1.5-2.0) and to control the mixing ratio. STI

2 T 61
[3,4-benzpyrene content of different smoked preparations.] 3,4-Benzpyren-Gehalt verschiedener Räucherpräparate.
Toth, L.; Blaas, W.
Fleischwirtschaft **52** (9) 1171 (1972) [4 ref. De, en] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

15 liquid smoke preparations and 1 sample of wood charcoal were tested for their contents of 3,4-benzpyrene, pyrene and fluoranthracene. 4 smoke preparations and the charcoal contained 1 part/billion 3,4-benzpyrene and very large amounts of the other polycyclic hydrocarbons. Although use of the preparations would not cause benzpyrene levels exceeding those of conventionally smoked products, concn. of other toxic smoke components could be increased. Toxicological examination of all preparations is recommended. RM

2 U 133
[Fish and fish products. Transport.]
Poland, Polski Komitet Normalizacyjny
Polish Standard **PN.71/A-87057** 5pp. (1971) [Pl]

This standard replaces **PN-64/A-87057** and covers transport by different means of live crucian carp, eel, tench, carp, white amur, bream, white and spotted tolpyga, pike and trout in water, of some of these fish and live river crayfish without water, as well as of frozen, salted, smoked, marinated or preserved fish and fresh or frozen fresh fish livers or roes. Stipulated requirements on duration of transport, water temp. where relevant, refrigeration, and examination are listed. SKK

3 E 91
Smoke generation.
Becker, H. (Becker Fleischereimaschinen & Apparatebau)
British Patent 1 283 215 (1972) [En]

A water-air mixture is passed through wood chips or sawdust, the water being in the form of mist or droplets and the mixture being at a temp. above the charring temp. of wood. The smoke quality is said to be improved and the smoking or curing time can be shortened considerably. IFT

3 R 146
[Method of preparing smoked fish.]
Zakharova, L. A.; Zvereva, V. S.; Glushko, T. I.; Gavrilova, O. N.; Shamova, N. I. (USSR, Tsentral'noe Konstruktorsko-tekhnologicheskoe Byuro Glavnogo Upravleniya Rybnoi Promyshlennosti Azovo-Chernomorskogo Basseina)
USSR Patent 318 382 (1972) [Ru]

Fish is defrosted, steeped in cooled brine until the salt content of the flesh is 3-4%, sprinkled with a mixture of spices, loaded into a vat in rows, covered with spiced brine (sp.gr. 1.06-1.09) and allowed to stand for 60-72 h at ≤10°C. The fish layer height must be ≤0.6 m, and the fish:brine ratio ≥1:1. The fish is then washed in the brine for 20-30 min to remove surface salt and placed on a rack for draining, pre-drying and smoking. The finished product contains 5-10% salt and 60-65% water. W&Co

3 R 147
Mackerel smoked by new process.
Anon.
Food Engineering **44 (12) 112 (1972) [En]**

A description is given of a new process for smoking mackerel. Cleaned, split mackerel are soaked in a brine solution, then hickory smoked at room temp. for 3-5 h. "Cold smoking" hardens the fish surface, sealing in the moisture. The fish are placed in cold storage for 24 h while the moisture diffuses through the meat. The next day they are "hot smoked" at 180°F for 1 h, this cooks the meat, heightens the smoky taste and colours the surface honey brown. AA

3 R 148
Effect of smoke-processing on muddy odor and taste in rainbow trout (Salmo gairdneri).
Iredale, D. G.; Rigby, D.
Journal of the Fisheries Research Board of Canada **29 (9) 1365-1366 (1972)** [1 ref. En, fr] [Fisheries Res. Board of Canada, Freshwater Inst., Winnipeg, Manitoba]

Because of problems with a 'muddy' odour and taste occurring in rainbow trout being reared commercially in some small prairie lakes in central Canada, full production potenital has not been realized. The possibility of masking the undesirable condition by smoke-processing was investigated using 2 methods: (i) resulting in a very high smoke concn. and (ii) achieving a smoke concn. similar to that of conventionally smoked fish. The treatment consisted of immersing in 80% saturated NaCl brine for 90 s at 60°F, smoke-processing for (i) 35 min or (ii) 75 min wrapped in saran then 10 min unwrapped, at 90°F and 60% RH, blast freezing and storage at -30°F. Fillets were thawed, wrapped in Al foil and steamed for 10 min. They were then evaluated for muddy odour and taste by an experienced taste panel. Muddiness is significantly masked by smoke processing and the effectiveness of masking appears to be related to the intensity of smoking. VJG

3 R 162
Chub mackerel of Thailand (Rastrelliger neglectus, Van Kampen): a short study of its chemical composition, cold storage and canning properties.
Keay, J. N.; Rattagool, P.; Hardy, R.
Journal of the Science of Food and Agriculture **23 (11) 1359-1368 (1972)** [21 ref. En] [Torry Res. Sta., Min. of Agric., Fisheries & Food, Aberdeen AB9 8DG, UK]

Proximate analysis, amino-acid analysis and lipid fatty acid analysis have been performed on Thai chub mackerel. Samples of the fish were stored in the unglazed, glazed and vacuum-packed condition at -14 and -30°C for 90 days; at intervals various chemical indices of deterioration were determined and taste-panel assessments performed. The data relating to lipid oxidation are considered in particular detail and attention drawn to the lack of agreement between the various indices of degree of oxidation. Samples of the fish were smoked and canned products prepared from these evaluated by a taste panel for possible commercial acceptability. AS

3 R 166
[Microbiological studies of food products and smoked fish products.] Mikrobiologicheskie issledovaniya kulinarnykh i kopchenykh rybnykh productov. [Book]
Shkol'nikova, S. S.
84pp. (1972) [113 ref. Ru] Moscow, USSR, Izdatel'stvo "Pishchevaya promyshlennost". Price 0.29 rouble

The book summarizes knowledge on microbiological investigations of fish, food products and smoked products including auxiliary materials Recommendations for growth media preparation

re included in a supplement. The book includes
ie following chapters: factors affecting the viability
f microorganisms; most frequent microorganisms
fish and fish products; microbiological
ivestigation methods; microbiological investigation
f raw materials; microbiological control of finished
roducts; microbiological control of auxiliary
aterials; sanitation; treatment of glass and
quipment used; and preparation of growth media.
TI

S 301
Smoking of meat products.]
enges, J.
evue des Fermentations et des Industries
limentaires 27 (2) 53-60 (1972) [33 ref. Fr, nl]
Service de Tech. Alimentaire, IIF-IMC, CERIA,
070 Brussels, Belgium]
The production of carcinogenic compounds on
noked meats is reviewed in relation to: smoking
rocess used (long or short cycle cold smoking; hot
r black smoking): methods of smoke production
nd use (including cooling, washing and filtering
noke, electrostatic precipitation, liquid aqueous or
ily smoke extracts); and effect of temp. of smoke
roduction and cooling on its 3,4-benzpyrene
ontent. RM

S 327
lodern cooking and smoking methods in small
nterprises.] Moderne Koch- und
äuchermethoden im Handwerksbetrieb.
lemm, W.
leischerei 23 (11) 13-14 (1972) [De]
Modern compact automated cooking and
noking chambers or cabinets suitable for small
nd medium size enterprises are illustrated and
escribed and it is pointed out that such enterprises
n now compete on equal terms with large
idertakings. SKK

S 330
ontinuous processing systems for skinless
ankfurters.
mon, S.
ood Technology 26 (12) 50, 55-56, 58-59 (1972)
ref. En] [Food Sci. Inst., Films-Packaging Div.,
nion Carbide Corp., 6733 W. 65th St., Chicago,
linois 60308, USA]
As the sausage industry moves to increase
roductivity and reduce material waste, many
usage-makers have installed continuous
ankfurter processing lines in their plants. The
ithor discusses many of the systems in use and
eir variations, as well as cured meat colour,
elability factors, the use of acids and smoke,
sings which aid in peeling, and the advantages of
ntinuous systems. IFT

3 S 337
[Method and apparatus for cold smoking or air-conditioned smoking by means of hot damp smoke.]
Verfahren und Vorrichung zum Kalt- bzw. Klimaräuchern mittels heissen Feuchtrauches.
Becker, H. (Heinz Becker Maschinen- & Apparatebau)
German Federal Republic Patent Application 1 792 381 (1972) [De]

Foods, e.g. bacon or ham, are subjected to cold smoking or controlled atm. smoking, using hot smoke which is produced from sawdust, and steam or a heated air-moisture mixture. Fresh air which has been cooled to -10° to +10°C is introduced when max. temp. is reached, and smoke is fed in at the min. temp. This prevents fat from melting, and accelerates smoking by reducing the moisture content of the atm. and the foods. Capacity to absorb moisture is thus increased when the smoke is reintroduced. W&Co

3 S 373
[Combined installations for treatment of meat and sausage products with smoke, steam and hot air.]
"Kombinations"-Anlagen zur Behandlung von Fleisch- und Wurstwaren mit Rauch, Dampf und Heissluft.
Maurer, S.
Fleischerei 23 (11) 38, 40, 43 (1972) [De]

This general article includes a historical survey of the application of steam, smoke and hot air to meat and sausages, and discusses the development of modern techniques, and the versatility and overall efficiency of today's plant. OW

4 F 166
[Interesting packaging possibilities for fish products.] Interessante Verpackungsmöglichkeiten für Fischwaren.
Schulz-Bödecker, D. F.
Feinkostwirtschaft 10 (1) 18-20 (1973) [De]

The use of cellophane (with or without a heat-sealable coating), other plastics films and, particularly, plastics laminates for packaging of various fish products is discussed in general terms. Total production of fish products by Federal Republic of Germany in 1971 was 232 139 t, the main items being marinated products (69 503 t), preserves (46 524 t), deep-frozen all-fish dishes (39 526 t), deep-frozen fish and fillets (24 188 t) and smoked items (16 743 t). The monetary value and % increase or decrease over 1970 are also given. HBr

4 R 195
[The use of vendace (Coregonus albula L.) in canning.]

Nikkilä, O. E.; Mälkki, Y.; Mennola, R.
0886ed No. 120, 14pp. (1971) [9 ref. Fi, en]

The catch of vendace today forms about 25% of the total catch from Finish lakes and from the most brackish waters of the Finnish coast. The properties of this fish and the optimal conditions for its processing were studied. The wt. of the fishes used was on average 28.5 g, their fat content 3.0%, and water content 80.2%. The optimal brining method was by immersion in a 21% brine at 15°C; this treatment reduced the water content to about 75%. Precooking in steam or peanut oil, or smoking at 65 to 80°C reduced the moisture further to 67-70%. Optimal temp. for sterilization was found to be 115-116°C, where processing to F_0 values 5-10 took 35-50 min using round 105 diam. × 21 mm cans. Organoleptically the most favorable ratings were obtained for products of the type "fish in oil and its own juice", made from lightly smoked fish, the flavour resembling that of sprats or smoked eel. Possibilities for increasing the production of canned vendace are discussed. AS

4 S 383
[Changes during storage: meat and delicatessen products.]
Östlund, K.
Livsmedelsteknik 12 (5) 223-226 (1970) [Sv]
[Inst. för Livsmedelshygien, Veterinärhögskolan, Stockholm, Sweden]

The author explains the significance of the anatomy and biochemistry of muscle in the development of flavour and colour changes in meat during storage. Microbial spoilage and its relationship to temperature, pH and humidity are discussed and the principles of a specially designed tray to preserve the appearance and extend the shelf-life of pre-packaged meat are explained in some detail. The microbial problems associated with the 3 classes of processed meat products: raw, smoked, and heat-treated, are also discussed. DJS

4 S 385
Interactions of some wood smoke components with ε-amino groups in proteins.
Chen, L.-B.; Issenberg, P.
Journal of Agricultural and Food Chemistry 20 (6) 1113-1115 (1972) [26 ref. En] [Dept. of Nutr. and Food Sci., Massachusetts Inst. of Tech., Cambridge, 02139, USA]

Interactions of some previously identified wood smoke components with meat and pure proteins were investigated. Uncured lean beef sirloin strips, exposed to wood smoke for 10 h, lost 44% of the available lysine initially present. Heating in air (65°, 10 h) caused a 15% of available lysine. Beef homogenate, treated with acidic, phenolic, or neutral fractions of smoke condensate, lost 14, 38, and 45% available lysine, respectively. A model system consisting of a soluble protein, bovine serum albumin (BSA), was treated with pure smoke components and the degree of interaction was determined spectrophotometrically by measuring the extent to which the protein reacted with dinitrobenzyl sulfonate. The reduction in available ε-amino groups observed when BSA was treated with sinapaldehyde and coniferaldehyde was comparable to that observed for some previously known active aldehydes (formaldehyde, glyoxal, pyruvaldehyde, and furfural). No significant interaction was detected when BSA was treated with phenol, cyclotene, eugenol, or syringol. A variety of colors, ranging from yellow to red, was produced by treating casein with aldehydes and phenolic aldehydes. AS

4 S 444
[The influence of preservation method on quality of meat and meat products. Survey of literature with special reference to chemical and physical aspects.]
Der Einfluss der Konservierungsverfahren auf die Qualität von Fleisch und Fleischerzeugnissen. Eine Literaturübersicht unter besonderer Berücksichtigung chemischer und physikalischer Aspekte.
Hofmann, K.
Fleischwirtschaft 52 (11) 1403-1404, 1407-1408, 1411-1412, 1415 (1972) [145 ref. De, en, fr]
[Bundesanstalt für Fleischforschung, 8650 Kulmbach, Blaich 4, Federal Republic of Germany]

The influence of method of preservation, i.e.g heating, drying, freezing, freeze-drying, irradiation, salting, curing and smoking on organoleptic and storage quality of meat products is discussed with reference to recent literature. RM

4 S 462
[The manufacture and composition of meat and sausage products typical of Baden-Württemberg. II. Black Forest hams.] Herstellung und Zusammensetzung für in Baden-Württemberg typischer Fleisch- und Wurstwaren. II. Schwarzwälder Schinken.
Merten, B.
Fleischwirtschaft 52 (11) 1438, 1441-1442 (1972) [De, en, fr] [Chem. Lab., 7800 Freiburg/Breisgau, Röderstrasse 8-10, Federal Republic of Germany]

Black forest ham is prepared by salting, drying and cold smoking of meat from pigs reared within strictly defined geographical limits. There is a 20-25% wt. loss during the process. 56 samples examined contained 22.4-62.6% water (mean 43.6), 14.8-27.1% protein (20.9), 1.5-2.7 water:protein ratio (2.1). RM

4 S 490
Effect of time and temperature of smoking on microorganisms on frankfurters.
Heiszler, M. G.; Kraft, A. A.; Rey, C. R.; Rust, R. E.
Journal of Food Science 37 (6) 845-849 (1972) [24 ref. En] [Dept. of Food Tech., Iowa St. Univ., Ames, 50010, USA]

The effect of different smoking schedules on microorganisms on frankfurters was studied. Frankfurters were smoked to internal temp. of 140°F (60°C), 150°F (65.8°C), 160°F (71.1°C) and 170°F (76.8°C). Prolonged smoking up to 30 min at 150°F (65.8°C) was also investigated. In general, survival or growth of organisms during subsequent storage at 5°C was inversely related to temp. or time of smoking. Greatest rate of reduction of organisms occurred during smoking 140°F (60°C) although further decreases were observed with heating to higher temp. Additional advantage of smoking to temp. up to 170°F (76.8°C) was obtained during later refrigerated storage.   IFT

4 T 198

Determination of phenolic wood smoke components as trimethylsilyl ethers.

Kornreich, M. R.; Issenberg, P.

Journal of Agricultural and Food Chemistry 20 (6) 1109-1113 (1972) [17 ref. En] [Dept. of Nutr. and Food Sci., Massachusetts Inst. of Tech., Cambridge, 02139, USA]

A rapid and simple method, developed for qualitative and quantitative analysis of phenol mixtures, was applied to investigation of wood smoke condensates and model food components exposed to smoke vapor. Phenolic fractions were isolated by conventional methods based on acidity, followed by formation of trimethylsilyl (TMS) ethers by treatment with N,O-bis(trimethylsilyl)trifluoroacetamide (BSTFA) at room temp. An internal standard, 3,5-dimethylphenol, was added to eliminate volumetric errors in gas chromatographic (gc) injection. Mass spectra of TMS derivatives provide as much structural information as spectra of free phenols and the derivatives are more readily separated by gc. Phenol, guaiacol, 4-methylguaiacol, and syringol were the major components found in the wood smoke vapor phase. Their concentrations were determined in smoke vapor and in oil and water models exposed to the vapor for 4 h.   AS

4 T 217

[Use of bicyclic compounds as aromatizing agents.]

Gautschi, F.; Willhalm, B.; Buechi, G. H.
(Firmenich & Cie)

Swiss Patent 527 571 (1972) [Fr]

Compounds such as 2-oxa-7-thiabicyclo [3.3.0] octa-5,8-diene, 8-methyl-2-oxa-7-thiabicyclo [3.3.0] octa-5,8-diene 6,8-diemthyl-2-oxa-7-thiabicyclo [3.3.0] octa-5,8-diene and 2-methyl-3-oxa-8-thiabicyclo [3.3.0] octa-1,4-diene are used in quantities of 0.005-1.000 ppm in 1-10% solutions in e.g. propylene glycol, triacetin, benzyl alcohol, or pure peanut oil and impart a roasted, grilled, or smoked flavour to foods and beverages. Examples relate to ice-cream, cakes, pudding, milk chocolate and instant coffee.   W&Co

4 U 237

Frozen smoked demersal fish fillets.

Republic of Ireland, Institute for Industrial Research & Standards

Irish Standard Specification **I.S. 175:1971, 12pp.** (1971) [En] Price £0.45 [Dublin, Republic of Ireland]

This specification applies to whole fillets or large pieces of whole fillets cut from demersal fish (i.e. fish which swim close to the bottom of the sea) that have been boned, dyed (if desired), cold smoked, packaged, frozen and maintained at a temp. necessary for the preservation of the product. Fillets may be either skin-on or skinless. The freezing rate shall be ≥¼ in/h from both sides until the centre temp. has reached -18°C, and the fillets shall be maintained at or below -18°C during storage. Requirements for wholesomeness, physical quality, package, marking and sampling are given. A tabulated schedule is given for evaluating the fillets, the evaluation being by numerical scoring with points being deducted for quality variation from a total of 100. The score of the product shall be ≥85 and the product shall be classed as Category A for odour and flavour. An appendix describes how to cook the product for evaluation of flavour and texture.   JA

5 B 55

[Metals in liquid smokes.]

Shiraishi, Y.; Kuzuhara, Y.; Sakagami, Y.

Journal of the Food Hygienic Society of Japan [Shokuhin Eiseigaku Zasshi] 12 (3) 216-219 (1971) [1 ref. Ja] [Dept. Public Health Pharmaceutics, Inst. of Public Health 6-1, Shiroganedai 4-chome, Minato-ku, Tokyo, Japan]

Metals in 26 commercial liquid smokes for food processing were analysed by atomic absorption method. The data for Pb, Zn, Cu, Cd, Mn, Co and Ni are tabulated in English.   TM

5 E 168

[Process for preserving meats and edible flesh by smoking, and products obtained by the said process.]

Breton, J.; Kullmann, M.-A.

French Patent 2 118 220 (1972) [Fr]

Meat, including poultry, fish and shellfish, is preserved by salting in a mixture of 7 l. of a nitrite salt, 1 l. of special spices known as 'I Braga Super' and 0.25 l. of coriander, in a cold chamber at ≤4° C. This treatment lasts for 8 days, the meat being inverted into a new container every 2 days. It is then removed, dipped into water at 20-25° C and dried for 12 h, then smoked with a mixture comprising 10 kg of oak sawdust, logs and charcoal, 1 kg of juniper and 1 kg of coriander, for 48 h. After smoking, the meat is dried, firstly in an air flow at 6-10° for 5 days and secondly at 0-8°C for 15 days.   W&Co

5 E 185
Smoking apparatus.
Caillarec, F.
Canadian Patent 918 500 (1973) [En]

The apparatus comprises ≥1 conduit for recycling smoke from 1 of the product-receiving chambers to another, the smoke proceeding directly from the smoke generator passing through at least a section of the said conduit. IFT

5 R 210
[Technology of fish products and the equipment involved.] Tekhnologiya rybnykh produktov i tekhnologicheskoe oborudovanie. [Book]
Novikov, V. M.
216pp. (1972) [19 ref. Ru] Moscow, USSR, Izdatel'stvo Pishchevaya Promyshlennost'

This book, designed for use in the special educational establishments run by the Ministry of the Fish Industry of the USSR, contains the following chapters: Fish and other marine products as raw material; Transport and preliminary processing of fish and other marine products; Production and storage of live, chilled and frozen fish and of fillets and comminuted fish; Production of salted, brined and marinated products; Curing, drying and smoking of fish; Production of preserves, canned products and culinary items; Production of fodder and technological products from fish; Production of medicinal oil and vitamin preparations; Processing of marine mammals; Production of food and technological products from marine invertebrates; and Production of food and technological products from algae. HBr

5 U 334
Health laws and regulations - Norway.
World Health Organization
International Digest of Health Legislation 23 (2) 299-317 (1972) [En] [Geneva, Switzerland]

A selection of Norwegian health laws and regulations is presented including the following which relate to food hygiene: Amendments of 22 Dec., 1969 to the General Regulations of 3 May, 1935 on the manufacture of and trade in foods, etc. (the definition of ' additives' given in Section 7 of the General Regulations is replaced; the following shall not be considered additives: water, common salt, sugars, ethyl alcohol, vinegar, natural spices, substances which are added during smoking with wood smoke, vitamins and mineral salts); Instructions of 4 March, 1970 of the Director-General of Health Services concenrning the use of artificial sweeteners (cyclamates) (cyclamates are deleted from groups IVb, VIb and VIIIb of the List of permitted additives, but they can be added to foodstuffs, condiments and stimulants for diabetics. Sweetening products containing cyclamates may be marketed as general commercial goods but must bear a label indicating their content and stating that the product should only be used by those persons who health reasons need to restrict their sugar and/or calorie intake); and Regulations of 25 June, 1971 concerning compulsory notification of the composition of food additives. VJG

6 F 233
[Storage tests on smoked herring.]
Danielson, C. E.
Livsmedelsteknik 13 (8) 370-371 (1971) [Sv]

Tests were carried out to determine the effect of vacuum packaging on the shelf-life of smoked herring. The fish were smoked the day after landing, and packaged in plastics pouches, half of them under vacuum; both whole and cleaned and filleted fish were used. Organoleptic and bacteriological (total, haemolytic bacterial, coliform, anaerobic and mould/yeast counts) tests were carried out weekly for 32 days. The results. given in graph form, show that vacuum packaging had little effect on the organoleptic and bacteriological properties. In both cases, the shelf-life of the product was ≤4 wk. HBr

6 R 293
[Symposium on the use of saltpetre (nitrate) in fish products.]
Norway, Hermetikkindustriens Laboratorium
Tidsskrift for Hermetikindustri 59 (1) 19-23; (2) 37-43; (3) 65-74 (1973) [No]

Summaries are given of papers given at the symposium, held on 16 Oct, 1972, and include: Dyestuffs in spiced herring, by D. Hakvag; The legal background to the use of nitrate in fish products in Sweden, by W. Jenning; Experience with the use of saltpetre in Sweden, by G. Liljegren; Treatment of smoked salmon with nitrite, by L. Herborg; The current status of nitrite and nitrate - scientific and regulatory - in the US, by A. G. Ebert [En, paper given in full]; and Effect of saltpetre on the quality and keeping characteristics of anchovies, caviare and herring 'titbits', by K. H. Skramstad [paper given in full]. An account of the discussion is also included. HBr

6 S 627
[The effect of smoking technology on the content of carcinogenic hydrocarbons in smoked meat products. II. Effect of smouldering temperature of wood and of cooling, washing and filtering of smoke.] Einfluss der Räuchertechnologie auf den Gehalt von geräucherten Fleischwaren an cancerogenen Kohlenwasserstoffen. II. Einfluss der Glimmtemperatur des Holzes sowie der Kühlung, Wäsche und Filtration des Räucherrauches.
Toth, L.; Blaas, W.
Fleischwirtschaft 52 (11) 1419-1422 (1972) [10 ref. De, en, fr] [Bundesnstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

Formation of carcinogenic polycyclic hydrocarbons was observed for all types of smoke production, the amounts increasing linearly with smoking temp. of 400° to 1000°C, especially higher (4-5 ring) compounds. When smoke was produced at low temp. of approx. 300°, smoked meat products contained 0.09 parts billion 3,4-benzopyrene (i) vs. approx. 0.4 parts billion with

normally produced smoke. Cooling reduced polycyclic hydrocarbons about 25% (3.7 to 2.4 µg (i)) washing 20-30% (1.5 to 1.2 µg (i)) increasing distance from smoke generator 40% (0.22 to 0.15 parts/billion (i) in product) filtering through cotton wool or steel wool 90% (18.7 to 1.6 parts/billion (i)). filtered smoke had very good smoke aroma. Higher deposition of carcinogens occurred during rapid hot smoking than slow cold smoking and very high deposition during black smoking, possibly due to build-up of soot with a high 3,4-benzopyrene content on the moist surface. [See FSTA (1973) 5 2S157 for part I.] RM

6 S 646

Collaborative study of the multicomponent method for polycyclic aromatic hydrocarbons in foods.

Fazio, T.; White, R. H.; Howard, J. W.

Journal of the Association of Official Analytical Chemists 56 (1) 68-70 (1973) [5 ref. En] [Div. of Chem. and Physics, FDA, Washington, DC 20204, USA]

A collaborative study was conducted on the multicomponent method for polycyclic aromatic hydrocarbons in foods. Samples of smoked ham fortified with benzo(a)pyrene, benzo(e)pyrene, benz(a)anthracene, and benzo(g,h,i)perylene were analysed by 12 collaborators. Average % recovery at the 10 parts/billion (µg/kg) level for the 4 compounds ranged from 70 to 90%. The within-laboratory SD indicates that the precision of the method is not significantly different for any one of the hydrocarbons. The method has been adopted as official first action. AS

6 S 682

[Nutritional value of sausages dried and smoked in a raw state.]

Sokolov, A. A.; Chekhovskaya, V. T.; Rodina, O. S.

Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 2, 67-69 (1972) [4 ref. Ru] [Moskovskii Tekh. Inst. Myasnoi i Molochnoi Promyshlennosti, USSR]

The effect of the smoking preparation and industrial smoking on the nutritive value of sausages was investigated. The investigation was carried out on samples to which Streptococcus diacetilactis culture was added, and on samples treated with sorbic acid or with the smoking preparation, and on sausages dried in a raw state. Development of aggregation processes in the protein system of the products decreases, to a certain degree, the nutritive value of the product and is directly proportional to the intensity of drying. Traditional smoking reduces the biological value of the sausages; treatment of the surface with smoking liquid prior to smoking is preferable. STI

6 T 281

[The chemical composition of a smoking medium.]

Shaposhnikov, Yu. K.; Khvan, E. A.; Stepanova, M. I.; Kondakova, L. V.

Rybnoe Khozyaistvo No. 9, 75-77 (1972) [1 ref. Ru]

The chemical composition of smoke produced by an ELRO-generator was investigated; the smoke is from burning coniferous wood sawdust with a moisture content of 52-62%; the concn. of the emanated smoke was 3.7 g/m^3; the temp. of the smoking box was 22-24°C and the smoke concn. 0.66 g/m^3. Results are presented of analyses of condensate, resins, phenols, carbonyl compounds, organic acids and bases, carcinogenic aromatic hydrocarbons; the analyses were made on the smoke from the outlet end of the generator and at the inlet and outlet ends of the smoking box. Some groups of substances, such as phenols and organic acids, were further analysed in more detail using gas chromatography. STI

6 U 400

[Dried cold-smoked zherekh (Aspius aspius). Quality requirements for attested product.]

USSR, Gosudarstvennyi Komitet Standartov

Soviet Standard **GOST 5.1103-71** 3pp. (1971) [Ru] [Moscow, USSR]

This standard covers dried cold-smoked Aspius aspius awarded the State mark of quality. Stipulated technological requirements and chemical and organoleptic characteristics include: NaCl, 5-9%; moisture, 52-58%; fat, ≥8%. Regulations on samplin analysis, packaging, labelling, transport and storage (at from -2°C to +2°C) are listed. Storage life is set at 2 months. SKK

7 R 309

[The role of the dispersion medium in smoking.]

Khvan, E. A.; Sadovskii, B. F.; Voskresenskii, N. A.

Rybnoe Khozyaistvo No. 6, 67-68 (1972) [Ru] [VNIRO, USSR]

The content of phenols was studied in a dispersion medium consisting of air, non-condensed water vapours and organic compounds produced by pyrolysis of wood; the content of the above substances in the dispersed phase and the role of these substances in smoking was also studied. The smoke without the dispersed phase (the latter being trapped on filters) was condensed at -30°C. The condensate contained 9 phenols, 7 of which were identified as guaiacol, phenol, meta- and ortho-cresols, methylguaiacol, meta- and para-xylenol. In the dispersed phase, the latter 3 substances were not found. Comparisons were made of electric-oven smoking with a dispersed phase of the smoke, electric-oven smoking with addition of the condensate, smoking using the dispersion medium only, accelerated smoking in an electric field and traditional smoking. The data are tabulated. Good results were obtained by using the dispersion medium for smoking; the best results were obtained using electric field smoking. STI

7 R 310
[Determination of 3,4-benzopyrene in smoked fish.]
Wierzchowski, J.; Gajewska, R.
Bromatologia i Chemia Toksykologiczna 5 (4) 481-486 (1972) [19 ref. Pl, ru, en] [Zaklad Bromatologii Akad. Med., Gdansk, Poland]

A procedure based on TLC separation and spectrophotometrix determination at á wavelength of 220-410 nm (SF-4 spectrophotometer of Soviet make, cyclohexanone as reference) has been developed for determination of 3,4-benzopyrene in 3 spp. of smoked fish: cod (Gadus morrhua), vimba (Vimba vimba) and sprat (Clupea sprattus). The 3,4-benzopyrene content was highest in the smoked sprat (average of 11.5 µg/kg) while the values determined in the cod and vimba, (and in the fleshy tissues of the sprat) ranged from 2.3 to 2.6 µg/kg. AS

8 S 840
[Smoking methods for meat and meat products.] Die Rauchwürzung von Fleisch und Fleischwaren.
Henning, W.
Fleischerei 24 (3) 54, 56, 58 (1973) [De, en, fr] [Inst. für Nahrungsmitteltechnik der Henning KG, D-2000 Hamburg 61, Federal Republic of Germany]

The benefits derived from smoking of meat products are outlined and modern improvements of the traditional processes are described. Important technical aspects discussed include: even flavour distribution in products and between successive batches; prevention of excessive smoking, particulalrly of outer surfaces of meat and sausage products; rapid and uniform treatment of interior portions; maintenance of min. concn. of carcinogenic constituents, e.g. 3,4-benzpyrene in the smoke; close control of smoke constituents by both official authorities and manufacturers; need for careful supervision; maintenance of min. numbers of bacteria and elimination of pathogens; and use of impermeable packaging materials to preserve smoke flavour. It is stated that by using modern processes it is possible to achieve a combination of technical efficiency, high hygienic standards and freedom from 3,4-benzpyrene. ELC

8 S 988
[Smoke flavour pickling of meat products; rapid treatment without 3,4-benzopyrene.] Die Rauchwürzpökelung von Fleischwaren im Schnellverfahren ohne 3,4-Benzpyren.
Henning, W.
Fleischerei 24 (4) 39 (1973) [De] [Inst. für Nahrungsmitteltech. der Henning KG, D-2000 Hamburg 61, Federal Republic of Germany]

It is known that normal smoking methods produce tarry products, including 3,4-benzopyrene, which are soluble in fats and introduce a possible health risk; such risks can only be avoided by using freshly prepared meats and low smoking temp. A new method (based on Federal German Patent 1 717 068) is discussed which employs rapid pickling in brine to which smoke flavour is added with any other spices. The process is simple, requires no special equipment and yields products (e.g. hams, cuts of turkey, beef or pork) having excellent smoked flavour but with only a negligible content of tar products and 3,4-benzopyrene. Standard injection pickling methods can be used and give uniform distribution of smoke flavour. A ratio of 5 g smoke product/kg meat product gives very good flavour. The method is easily adaptable to hand processing e.g. by treatment of meat with smoke liquid, cutting to required piece size, rapid treatment for 1-2 h in pickling ~~brine~~ and final air drying. Various practical procedures are suggested; frozen and thawed meat gives high quality products. A suggested pickling recipe is 15 parts pickling salts:5 parts smoke flavour, with removal of any tar deposits. ELC

8 S 990
[Prototype of an automatically controlled smoke chamber.]
Pokorny, F.
Prumysl Potravin 24 (4) 111-113 (1973) [Cs, en, ru] [Vyzkumny Ustav Masneho Prumyslu, Brno, Czechoslovakia]

A prototype of an automatically controlled smoke chamber for sausages is described and diagrammatically illustrated. The efficiency of the prototype in smoking 6 types of sausage was compared with efficiencies of the commercial BUD box kiln and AKTUA tunnel kiln. Energy saving of ≤30% in the prototype vs. the commercial installations is ascribed to efficient lagging and correct smoking conditions. A mobile version of the prototype is intended for further test under commercial conditions. SKK

8 T 440
[A rapid method for determining benz[a]pyrene in smoke aroma.] Eine schnelle Bestimmungsmethode für Benz[a]pyren in Raucharomen
Rijk, M. A. H.; Battum, D. van
Deutsche Lebensmittel-Rundschau 69 (2) 75-78 (1973) [14 ref. De, en, fr] [Zentralinst. für Ernährungsforschung TNO, Zeist, The Netherlands]

A TLC-densitometric method for determination of benzo[a]pyrene in smoke preparations is described. 2.5 g of the material under test is boiled with 25 ml of 1 N ethanolic KOH solution for 30 min under reflux. After cooling, 50 ml of cyclohexane is added and the mixture is boiled for 2 min, cooled and transferred to a separating funnel. 50 ml of 1 N aqueous KOH solution is added; after shaking for 2 min the cyclohexane layer is separated, washed, dried, filtered and evaporated to 1 ml. The benzo[a]pyrene is then separated by TLC on cellulose acetate, using ethyl ether/methanol/water (4:4:1) as the developing solvent. The benzo[a]pyrene spot [illegible] off, extracted, concentrated to [illegible]

reseparated by TLC. The benzo[a]pyrene concn. is then determined by UV fluorescence densitometry. Experiments with smoke preparations spiked with 200 ppb benzo[a]pyrene showed that recovery was approx. 84.5% with a variation coefficient of ±31%. Brief instructions are given for photography of the TLC plates. AJDW

9 R 436
Smoked mullet quality: an assessment.
Koburger, J. A.; Mendenhall, V. T.
Journal of Milk and Food Technology 36 (4) 194-195 (1973) [8 ref. En] [Food Sci. Dept., Univ. of Florida, Gainesville, 32601, USA]

A survey of 12 smoked mullet processors in Florida was conducted and 33 retail samples were analysed. Although microbiological analyses of the finished product did not indicate that any overt hazard existed, certain aspects of production, handling, and marketing could potentially generate a health hazard if not carefully controlled. AS

10 S 1225
[Ripening and colour changes in porcine smoked fat tissue.]
Dragoni I.; Cantoni, C.
Euroviande - Courrier des Abattoirs 14 (77) 41-45 (1973) [Fr]

Samples of smoked rolled pig fat tissue, pickled and conditioned after cooking (at 14-15°C and 80-82% RH) for 7, 14, or 21 days were examined bacteriologically and biochemically. It is concluded from tabulated results that peroxide values and contents of free fatty acids and non-protein N increased during conditioning. Yellow discoloration appeared uniformly or localized. The former discoloration was due to oxidation by ambient O_2 and the latter to bacterial growth, Micrococcus flavus and Sarcina flava in particular. SKK

10 U 719
[Smoked fish. Methods of sampling.]
Poland, Polski Komitet Normalizacji i Miar
Polish Standard **PN-72/A-86771** 2pp. (1972) [Pl]

10 U 726
['Valmierskii' special smoked ham. Quality requirements for attested product.]
USSR, Gosudarstvennyi Komitet Standartov
Soviet Standard GOST 5.1303-72 4pp. (1972) [Ru] [Moscow, USSR]

This standard covers 'Valmierskii' special smoked ham awarded the state mark of quality. Stipulated technological requirements and organoleptic and chemical characteristics include: cooking salt, ≤2.5%; and nitrites, ≤5 mg/100 g. Regulations on methods of inspection and analysis, packaging, labelling, transport, storage (at 0-6°C and ≤85% RH) and supplier's guarantee are listed. SKK

11 E 421
Smoking apparatus.
Seelbach, B. H. (K. C. Seelback Co. Inc.)
United States Patent 3 747 513 (1973) [En]

Three-chambered apparatus for the uniform smoking of foods is described. IFT

11 G 539
[Phenol and formaldehyde contents in smoked foodstuff.]
Cantoni, C.; Dragoni, I.; l'Acqua, V.
Industrie Alimentari 12 (4) 77-80 (1973) [15 ref. It, en] [Istituto di Ispezione Aliment. Origine Animale, Univ., Milan, Italy]

The amounts of phenol and formaldehyde have been determined in 10 samples of each of the following smoked foods (i) calabrian sausage, (ii) smoked pork fat, (iii) speck (sic), (iv) raw ham, (v) bacon, (vi) lard, (vii) Hungarian salami, (viii) wurst, (ix) pariser (sic), (x) herrings, (xi) herring fillets, (xii) unfermented cheese and (xiii) cheese. Results show only a trace of HCHO in all the foods except (viii), (x) and (xi) where average values (in mg/100 g) are 0.126, 0.065 and 0.109 respectively. Average values for phenol (mg/100 g) are: (i) 0.057, (ii) 0.101, (iii) 0.074, (iv) 0.054, (v) 0.074, (vi) 0.116, (vii) 0.061, (viii) 0.157, (ix) 0.1375, (x) 0.100, (xi) 0.107, (xii) 0.058 and (xiii) 0.038. LA

11 R 529
[Problems in determination of parameters for electrical smoking of sprat without use of rods.]
Chivilenko, V. P.; Muravlev, A. S.
Trudy Vsesoyuznogo Nauchno-issledovatel'skogo Instituta Morskogo Rybnogo Khozyaistva i Okeanografii 88, 87-95 (1972) [Ru, en]

To mechanize the production of canned smoked fish some devices have been designed and tested to eliminate the application of rods in the electrical smoking of sprat. These included shaking nets, vibrating strings and stirrers, as well as strings and nets covered with anti-adhesive materials; net, cogged and slot electrodes were also designed and tested. The fish were found to be most evenly smoked with application of slot electrodes, while the best quality of smoking was obtained when vibrating strings were used in combination with slot electrodes. AS

11 R 530
[Determination of the optimum relationship of smoking parameters for cold smoking of fish, using the method of mathematically-planned experiments.]
Bunin, D. Kh.
Trudy Vsesoyuznogo Nauchno-issledovatel'skogo Instituta Morskogo Rybnogo Khozyaistva i Okeanografii 88, 134-148 (1972) [9 ref. Ru, en]

The results of experiments carried out while smoking Atlantic horse-mackerel at a canning plant

are given. The application of the method of mathematically-planned experiments made it possible to reduce substantially the number of experiments and to obtain statistically reliable data. The objective of the experiment was to reduce the time of smoking. According to the programme, 3 factors affecting the smoking process, viz. humidity, average speed of smoke movement and smoke density, were tested in various combinations. An optimum ratio of parameters allowing the smoking time to be reduced by 30% was determined. AS

11 S 1358
[Automation of manufacture of smoked sausages.]
Mihajlovszkij, E. H. [Mikhailovskii, E. A.]; Uszkov, V. J. [Uskov, V. I.]
Husipar **22 (3) 114-118 (1973)** [Hu, en, de, ru]

A mathematical model of smoked sausage manufacture operations, developed at the Leningrad Meat Processing Plant, is described. The model permits optimization of production schedules, modification of production processes following breakdowns, and determination of the optimal number of drying and storage chambers. [From En summ.] AJDW

11 U 792
[Raw smoked sausages. Quality requirements for attested products.]
USSR, Gosudarstvennyi Komitet Standartov
Soviet Standard **GOST 5.100-68** 8pp. (1972)
[Ru] [Moscow, USSR]

This revised edition of the 1968 standard incorporates Amendment No. 4 and covers the following types of raw smoked sausage awarded the state mark of quality: Braunshveigskaya, Moskovskaya, Sovietskaya, Stolichnaya, Nevskaya, Pol'skaya, Maikopskaya, Cervelat, Turistskie, Dneprovskaya, Osobennaya, Zhemaitishka, and Zernistaya. Stipulated technological requirements and recipes, and physical, chemical and organoleptic characteristics include: $NaNO_2$ for all types, ≤3 mg/100 g; moisture range is ≤25-30% and cooking salt range is ≤4.5-6.0%. Regulations on methods of examination and analysis, packaging, labelling, transport and storage are listed. Storage life is set at 4 months at ≤12°C and 75-78% RH, and at 9 months at from -7° to -9°C. For sliced sausage packaged in polyethylene film, storage life is set at ≤8 days at 5-8°C and at ≤6 days at 15-18°C. SKK

11 U 793
[Cooked smoked sausages. Quality requirements for attested products.]
USSR, Gosudarstvennyi Komitet Standartov
Soviet Standard **GOST 5.537-70** 5pp. (1973)
[Ru] [Moscow, USSR]

This revised edition of the 1970 standard [see FSTA (1971) 3 2U127] incorporates Amendment No. 2 and covers (i) Moskovskaya' and (additionally to original standard) (ii) 'Cervelat' cooked smoked sausages awarded the state mark of quality. Stipulated quality and composition requirements for (i) sausage meat and sausage remain unchanged. For (ii) sausage meat they include: dressed highest quality beef, 25 kg/100 kg; dressed lean pig meat, 25 kg/100 kg; and dressed fatty pig meat, 50 kg/100 kg; other ingredients (g/100 kg), salt 3000, sodium nitrite 10, sucrose 200, black or white pepper 150, nutmeg or cardamom, 30. Stipulated requirements for (ii) sausage include those quoted for (i) in the original standard. Regulations (amended) on packaging, labelling, transport and storage are listed. Storage life of (i) and (ii) is set at ≤15 days at 12-15°C and 75-78% RH, at ≤1 month at 0-4°C and at ≤4 months at -7° to -9°C. SKK

11 U 805
[Canned foods: smoked mussels in oil. Quality requirements for attested product.]
USSR, Gosudarstvennyi Komitet Standartov
Soviet Standard **GOST 5.1647-72** 4pp. (1972)
[Ru] [Moscow, USSR]

This standard covers smoked mussels in oil packaged in ≤140 ml cans and awarded the state mark of quality. Stipulated technological requirements and bacteriological, chemical, physical and organoleptic characteristics include: sand and calcareous formations, ≤0.1%; cooking salt, 1.3-2.2%; wt. of mussels (in terms of total contents), 75-90%; wt. of oil, 10-25%. Regulations on methods of examination and analysis, packaging, labelling, transport and storage (at ≤75% RH) are listed. SKK

11 U 807
[Lightly smoked sausages. Quality requirements for attested products.]
USSR, Gosudarstvennyi Komitet Standartov
Soviet Standard **GOST 5.101-71** 7pp. (1972)
[Ru] [Moscow, USSR]

This revised version of the 1971 standard [see FSTA (1972) 4 5U246] incorporates Amendment No. 1 and covers, in addition to (i) 'Okhotnich'i Kolbaski' and (ii) 'Armavitskaya' covered by the original standard, (iii) 'Drogobychskaya' and (iv) 'Prikarpatskaya' highest quality lightly smoked sausages awarded the state mark of quality. Data for (iii) and (iv) analogous to those quoted for (i) and (ii) in the above abstr. were respectively: cooking salt, ≤3.5 and ≤3.0%; sodium nitrite, ≤5 and ≤5 mg/100 g; moisture, ≤60 and ≤48% for local consumption and ≤45% for export outside boundaries of administrative region. Regulations (amended) on packaging, labelling, transport, storage and supplier's guarantee are listed. Storage life for (i) in containers at ≤6°C and 75-78% RH and for (ii), (iii) and (iv) kept hanging at ≤12°C and 75-78% RH is set at ≤10 days; and for (iv) in containers at ≤6°C it is set at ≤15 days. SKK

12 E 438
[Automatic smoke generators.]
Mareeck, S.; Rusz, J.; Pokorny, F.; Brzobohaty, Z.
Prumysl Potravin **24** (7) Suppl. Potravinarska a Chladici Technika **4** (4) 97-101 (1973) [Cs, fr, en, de, ru] [Vyzkumny Ustav Masneho Prumyslu, Brno, Czechoslovakia]

The automatic (i) AVK-1 smoke generator and (ii) AVKP-1 superheated steam (280-380°C) smoke generator, both manufactured by the Meat Industry Research Institute in Brno, Czechoslovakia and the (iii) Hansamatic II smoke generator (Mittelhäuser-Walter, Federal Republic of Germany) are described and diagrammatically illustrated. Performance data in smoking various types of sausage and smoke composition data are tabulated for the 3 generators used in conjunction with BUD II ((i) and (ii)) or ATMOS (iii) smoke chambers. It is concluded that both customary and superheated steam generators give satisfactory results but that (ii) requires some further development work. SKK

12 R 587
[Mechanized production of cold smoked fish.]
Piletskii, M. M.
Rybnoe Khozyaistvo No. 3, 59-63 (1973) [Ru] [Baltiiskii Rybokombinat, USSR]

An analysis was made of the cold-smoking process for fish (i.e. thawing, salting, sorting, slipping on the smoking rods, preliminary drying, smoking, packing) with the object of using a mechanized line for different designs of smoke house. Production indices of different smoke houses are compared, and also the possibilites of mechanization of transport operations. A comparative computation of labour requirements of dry and wet salting of fish and economic indices of cold-smoked fish production at 4 different plants are given. For newly built smoke houses, the most suitable design seems to be a tower type; for reconstructed smoke houses a tunnel type seems to be the best (unless the reconstructed smoke house is a tower type). STI

12 R 588
[Storage of smoked products from cartilaginous fish.]
Skachkov, V. P.
Rybnoe Khozyaistvo No. 3, 75-76 (1973) [1 ref. Ru] [AzcherNIRO, USSR]

The authors studied the organoleptic properties of "balyk" fish and determined the contents of carbamide, ammonia and water to establish the optimal storage duration. Elasticity and changes in the peroxide number were also determined. The optimal storage time for hot smoked products was 3 days, for cold smoked products 30 days. Fat content reduced the loss of moisture. When stored for a long time, the elasticity of the meat changed considerably. No symptoms of fat spoilage by oxidation were observed during storage. STI

12 S 1483
[Principles of smoking.] Grundlagen des Räucherns.
Kersken, H.
Fleischwirtschaft **53** (7) 921-922, 924-925 (1973) [De] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

Principles of smoking by the classical method are explained, including production of smoke, its composition and variation blown temp. and raw materials, and effects on smoked products. New developments are briefly discussed, including electrically or gas heated "glimmer" smoke production, friction, fluidization steam, electrostatic and "smokeless smoking" (using smoke condensate spraying or dipping.) RM

12 T 621
Isolation and identification of the components of the tar of hickory wood smoke.
Hruza, D. E.; Praag, M. van; Heinsohn, H.
Abstracts of Papers, American Chemical Society **166**, AGFD 111 (1973) [En] [International Flavors & Fragrances, 1515 Highway 36, Union Beach, New Jersey 07735, USA]

The volatile components of hickory wood tar were fractionated by preparative GLC. Individual fractions were analysed by a gas chromatograph coupled to a Hitachi RMU 6E mass spectrometer. Mass spectral identifications were confirmed by I_E values. The following compounds are among those being reported for the first time from hickory wood tar: 2-methyl-2-butenoic acid; benzaldehyde; 2-acetyl-furan; 2-cyclohexenone; 2,3-pentanedione; acetophenone; resorcinol; vinyl phenol; 2,6-dimethyl phenol; and 2-ethyl phenol. A total of 6 aldehydes, 8 ketones, 4 esters, 6 furans, 12 aromatic hydrocarbons, 32 phenols, and 13 acids were identified. AS

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J. NEWTON,
ASSISTANT EDITOR

1

Determination of botulinogenic properties and safe shelf-life of perishable products.
Smelt, J. P. P. M.
Antonie van Leeuwenhoek **39** (2) 367 (1973) [1 ref. En] [Unilever Res., Vlaardingen, Netherlands]

A smoked vacuum-packed fish product ('Buckling filet') about to be launched on the market, whose salt concn. was too low (<6%) and pH too high (>5.0) to exclude growth and toxinogenesis of Clostridium botulinum type E, was tested by inoculation with 3 toxigenic strains of Cl. botulinum type E. Incubation at 8°C for up to 41 days failed to produce any demonstrable amounts of toxin in the smoked vacuum-packed fish. A storage period of 21 days at 7.5°C was considered justified on the basis of the results. EJM

2

[Continuous equipment for heat treatment of meat products.]
Foltanyi, J.; Orsos, K.; Fischer, I.
Husipar **22** (4) 166-170 (1973) [Hu, ru, en, de]

Development and operation of a continuous installation for heat treatment and smoking of sausages and other meat products are described. [From En summ.] AJDW

3

A procedure for processing smoked channel catfish (Ictalurus punctatus).
Boggess, T. S., Jr.; Heaton, E. K.; Beuchat, L. R.
Journal of Milk and Food Technology **36** (9) 469-473 (1973) [11 ref. En] [Dept. of Food Sci., Univ. of Georgia, Agric. Expt. Sta., Experiment, 30212, USA]

A study was made to determine the most acceptable procedure to prepare smoked channel catfish. Effects of storage time before brining, fish wt., brining times and formulae, smoking times and temp., and storage time after processing on final product quality were evaluated. Use of freshly dressed catfish yielded a smoked product indistinguishable from that prepared from frozen catfish. Catfish average 10.5 oz (dressed) and brined for 24 h at 40°F in a mixture prepared by dissolving 9 lb (sucrose), 9 lb NaCl, 0.23 oz KNO_3, and 0.23 oz $NaNO_2$ in 72 lb water were highly acceptable. A gradual increase of internal flesh temp. from 90 to 140°F over a 22-h smoking period, followed by an increase to 180°F over 4 h with an additional 30 min at 180°F was judged as optimal for producing smoked catfish. Sensory panel evaluations on the finished product showed that smoked catfish were equally acceptable when compared with smoked haddock and chubs. AS

4

[Smoked fish product.]
Tohoku Ham Co. Ltd.
Japanese Patent 4825507 (1973) [Ja]

A process is described in which the fish species Arctoscopus japonicus is steeped in a D-sorbite solution before or after salting, after which it is smoked to yield a product in which the meat is easily separated from the bones. IFT

5

Clostridium botulinum control in cold-smoked salmon: a review.
Southcott, B. A.; Razzell, W. E.
Journal of the Fisheries Research Board of Canada **30** (5) 631-641 (1973) [62 ref. En, fr] [Fisheries Res. Board of Canada, Vancouver Lab., Vancouver 8, British Columbia]

This review considers questions concerning the growth and toxin production of Clostridium botulinum in cold-smoked salmon. In order to produce a product which would be safe as well as acceptable from the consumers' point of view, consideration must be given to the worst abuses to which the product might be exposed. Present knowledge regarding the effects of salt, smoke, and other factors on the preservation of cold-smoked salmon is inconclusive. Strict control of the storage temp. is the only method of positively preventing toxin production or outgrowth of spores of Cl. botulinum. In comparison with fish processed through a hot-smoke procedure, cold-smoked salmon appears to present a lesser hazard, but for unknown reasons. AS

6

[New regulations on smoking of meat.] Der Rauch und seine Anwendung nach der neuen Fleisch-Verordnung.
Bluhm, K.
Fleischwirtschaft **53** (10) 1389-1392 (1973) [De]

The effects of 1973 Federal Republic of Germany regulations on manufacture of smoked meat are discussed. In the altered test, "smoking" of meat and meat products is replaced by "external smoking", use of previously smoked meat and other ingredients is allowed, addition of smoked ingredients restricted, use of liquid smoke essence or condensate is prohibited and max. mean content of 3,4-benzpyrene set 1 µg/kg (1 part/billion). RM

7

Smoking apparatus.
Baker, H. O.; Hoff, J. E. (Peter Eckrich & Sons)
United States Patent 3 763 767 (1973) [En]

Apparatus employing a heated smoke regeneration zone in which a liquid smoke composition is dispersed to yield a smoke aerosol having a reduced carcinogen content is described. IFT

8

[The reliability of the automatic control system of the 'ELRO' heating equipment.]
Vasin, A.; Sheinberg, A.; Khiterer, E.
Myasnaya Industriya SSSR **43 (10) 27-29 (1972)** [4 ref. Ru]

The reliability of heat processing of smoked products in ELRO smoking and cooking equipment was calculated; details of the caclulations are given. STI

9

[Method for production of raw-smoked sausages.]
Kremnev, O. A.; Borovskii, V. R.; Kravets, S. S.; Arias-Vihil, A. A.; Alekseev, N. F.; Tsvetkov, V. A.; Bogdanovskii, V. B. (**Union of Soviet Socialist Republics**, Institut Tekhnicheskoi Teplofiziki AN Ukrainskoi SSR)
USSR Patent 384 499 (1973) [Ru]

Sausages are smoked with a smoke-air mixture and air dried in several stages, each successive smoking stage being completed before drying and the RH of the smoke-air mixture being maintained at a lower value then that of the drying air. Treatment with smoke-air mixture is preferably carried out for 2-8 h at 20-40°C, 30-50% RH and 0.5-1.5 m/s flow rate, and air drying for 16-22 h at 20-40°C, 85-95% RH and 1-3 m/s. W&Co

10

[Changes in smoking technology following changes in meat regulations.] Betrachtung zur Änderung der Räuchertechnologie nach der kommenden Fleischverordnung.
Henning, W.
Fleischerei **24** (5) 73-76 (1973) [De] [Inst. für Nahrungsmitteltech., Henning KG, D-2000 Hamburg G1, Federal Republic of Germany]

Effects of changes in the regulations for meat products in the Federal Republic of Germany are discussed, with special reference to regulations for use of smoked meat or other foods as flavourings in meat products, and the reduction of the permitted 3,4-benzpyrene concn. to 1 part/billion. AJDW

11

Lebanon bologna. I. Manufacture and processing.
Palumbo, S. A.; Smith, J. L.; Ackerman, S. A.
Journal of Milk and Food Technology 36 (10) 497-503 (1973) [13 ref. En] [E. Regional Res. Center, Philadelphia, Pennsylvania 19118, USA]

A process devised in a pilot plant to manufacture Lebanon bologna consists of 3 steps: (i) ageing salted beef at 5°C for 10 days; (ii) smoking the stuffed bolognas at 35°C and high RH for 4 days; and (iii) mellowing the smoked bolognas at 5°C for 3 days. Ageing the salted beef serves to enrich for a lactic microflora which will carry out the fermentation and for a micrococcal flora which will reduce nitrate to nitrite. Development of a firm cohesive structure which is characteristic of Lebanon bologna is related principally to acid production and only slightly ro smoking. Fermentation occurs during the smoking period with the pH of the bolognas falling at least one pH unit during the first 2-3 days. Nitrate reduction and subsequent formation of nitrosylmyoglobin occur within the first 24 h. Flavour of Lebanon bologna is described as both acid and smoky. Both components develop during the lenghty incubation in the smoke house. AS

12

[New smoking techniques.]
Gubler, D.; Vernois, M.
Industries Alimentaires et Agricoles **89** (5) 621-624 (1972) [8 ref. Fr, de, en]

Smoking is commonly used to impart desirable flavour and colour to meat products rather than for the traditional purpose of preservation. Primitive methods and equipment, giving variable results, are being replaced by either modern smoke generators or direct addition of liquid smoke flavours. Improvements have been achieved by separating the smoke generator from the smoking chamber. Modern smoking chambers permit improved control of required temp. (20-80°C) and humidity, with good turbulence. Modern independent generators can supply smoke of regular composition at a controlled rate, using wood shavings rather than sawdust. Liquid smoke preparations are obtained by aqueous extraction of aromatics from wood smoke; these are complex mixtures of approx. 50 components (phenols, carbonyls, alcohols, acids), which are easily dissolved in acetic acid of 6% min. concn. [Continued in following abstr.] ELC

13

[New smoking techniques.]
Gubler, D.; Vernois, M.
Industries Alimentaires et Agricoles 89 (5) 621-624 (1972) [8 ref. Fr, de, en]

[Continued from preceding abstr.] Methods of

use comprise: direct addition and mixing (sausage meat); brief dipping (5-60 s) for mild treatment; injection with pickling brine at 0.25-1.0% concn. (hams); speaying smoke liquid in a treatment tunnel; and a recent method (preferably completing other methods) of spraying atomized smoke liquid into the base of a drying chamber, using min. pressure 4 kg, min chamber temp. 40°C and RH mix. 30%, but preferably 60 min drying at 55°C, 15 min atomization, 20 min rest period, 50 min at 55°C, 3 min atomization, 10 min final rest and drying. ELC

14

Studies on smoking of eel fillets.
Solanki, K. K.; Kandoran, M. K.; Venkataraman, R.
Fishery Technology 7 (2) 169-176 (1970) [12 ref. En] [Central Inst. of Fisheries Tech., Sub-station, Veraval, Gujarat State, India]

Studies were made of a method for preparing smoked eel fillets. Medium-size fresh eels (2.5-5 kg each and 120-150 cm long) were cleaned with water, bladder and guts were removed and fillets (skin-on) of various sizes (16 × 2, 16 × 2.5, 16 × 3, 18 × 4, 20 × 5 cm) were obtained. Effects of the following factors on product quality were then studied: fillet size; dry salting; brine concn. (5, 10, 15 and 20% for 30 min); brining time (15, 30 and 45 min and 1, 1½, 2 and 3 h in 20% brine); pre-drying period (sun-drying for 15, 30 and 45 min and 1 and 2 h); source of smoke (teak, 'sajad', acacia and mango wood saw dusts, teak wood chips, coconut husk and coconut husk + teak saw dust); smoking period (up to 20 h); final drying period (up to about 7 H); moisture (21.3 to 57.8%) and salt (8.23 to 14.52%) contents of final product. Results are presented in graphs and tables and discussed in detail. From the results the following conditions are suggested for producing a top quality product: fillet size 16 × 3 and 16 × 2.5 cm and 2.5 cm thick, salting by dipping in 20% brine for 30 min; pre-drying in the sun for 30-45 min; equal proportions of coconut husk and teak saw dust (wt. basis) as smoke source; smoking for 15 h; final drying period of 5 h; final moisture content 30-35%; final salt content about 13%. A product manufactured according to these recommendations had a shelf-life of about 8 months at room temp. when packaged in polyethylene bags. The smoked fillets had an attractive reddish colour, pleasant odour and a palatable flavour. Compositional data are presented. JA

15

[Hot smoked fish.]
Union of Soviet Socialist Republics,
Gosudarstvennyi Komitet Standartov
Soviet Standard **GOST 7447-72** 8pp. (1972) [Ru] [Moscow, USSR]

This standard replaces **GOST 7447-55** and covers hot smoked fish with the exception of Acipenseridae, Engraulidae, herrings, smelts, Mullus barbatus, Trigla hirundo, sardines (sardine, pilchard, sardinella), Corregonus maraenula (albula), small Azov/Black Sea horse mackerels and mackerels, sprats, Cottidae (but not oceanic), dace, and oceanic cartilaginous fish. Stipulated technological requirements and organoleptic, physical and chemical characteristics are stated. Regulations on sampling, analysis, packaging, transport (at from -2° to +2°C or, for frozen fish, at not less that -9°C) and storage (at from -2°C to +2°C for periods defined by the USSR Health Ministry, or, for frozen fish, at not less than -18°C for ≤30 days). SKK

16

[Method of producing smoke condensates, and treatment of foods with smoke condensates.]
Verfahren zur Herstellung von Rauchkondensaten und die Behandlung von Nahrungsmitteln mit Rauchkondensaten.
Henning, W.
German Federal Republic Patent Application
2 216 654 (1973) [De]

Water-soluble smoked food or food additive, particularly meat and sausage products, sugar, salt and spices, is treated with an aqueous phase of a wood distillate, e.g. pyroligneous acid, from which tarry constituents have been removed by extraction, rinsing, etc. The extract or rinse water is then cleared of non-soluble constituents and the residue of the smoked food, and recycled for extraction or rinsing. This process may be repeated several times. The foods acquire an improved smoked flavour without the usual taste of smoke condensates.
W&Co

17

[Technochemical characteristics of the fish types Diapnus coeruleus and Arctoscopus japonicus.]
Mel'nikova, O. M.
Rybnoe Khozyaistvo No. 5, 72 (1973) [Ru] [TINRO, USSR]

The fillet yield from Diapnus coeruleus 6-12 cm long was found to be 54-58%. Muscle tissue from fish of the March catch contained 15.3-17.2% fat, 15.6-16.3% protein and 1.4-2.8% minerals. The fat had a low I value (109) and a pleasant taste. The best processing methods are freezing, smoking and canning. Fillet yield from 12-19 cm long Arctoscopus japonicus was 34-47%; muscle tissue contained 7.2-12% fat, 14% N and 1.4% minerals. T fish is suitable for smoking, canning and manufacture of delicatessen products. STI

18

[Improving the bursting resistance of frankfurter-type sausages.] Möglichkeiten zur Verbesserung der Platzfestigkeit von Würstchen. [Lecture]
Reichert, J. W.; Höll, J. C.
Fleischwirtschaft 54 (1) 29-32 (1974) [16 ref.

De] [Konserveninst., 2350 Neumünster, Kieler Strasse 204, Federal Republic of Germany]

Important factors affecting the bursting resistance of frankfurter-type sausages are discussed, including factors influencing swelling of the meat mixture (processing of warm meat, use of additives, collagen content, level of salting, vacuum grinding), technological factors (grinding and mixing technique, filling of casings, smoking, drying) and heat treatment (sterilization and autoclaving conditions). Considerable improvements were achieved when sausages were dried at 15°C after smoking, then cooled. Dependence of sterilization time and pressure on the sterilization temp. and diam. of the sausages is briefly discussed. RM

19

[Method of producing smoke for smoking foods.]
Verfahren zur Erzeugung von Rauch zum Räuchern von Lebensmitteln.
Bauer, K.
German Federal Republic Patent Application
2 150 485 (1973) [De]

Smoke is obtained from raw materials by heating them in a 200-400°C air current to effect decomposition without separating out the carcinogenic constituents. The humidity of the air is controlled so as to produce either a gaseous or a condensed liquid smoking medium. Due to its low specific heat, air is heated more economically than steam. W&Co

20

The German food industry today.
Anon.
Food Manufacture 49 (3) 39-40, 43, 45-46, 48, 57 (1974) [15 ref. En]

This survey of the Federal German food manufacturing industry discusses production data, organization and noteworthy technical developments under the following headings: canning industry (canning for institutional catering, rotary sterilization, automatic steam peeling, spray pasteurizer, vacuum boiling of jams, filling machines, harvesting machines); meat and fish products (smoking, vapour smoke (condensate smoke), mincer-cooker, vacuum cutters, fish processing machines); chocolate and confectionery (roasting, comminution, conching, spincasting of sweets, automation); dairy industry (mixed products, freeze-dried curd (white cheese)); packaging (metal containers); and organizations, research, training. JA

21

Preliminary studies to improve the quality of Coorg Monsoon Mandarins (Citrus reticulata Blanco).
Ramana, K. V. R.; Saroja, S.; Setty, G. R.; Nanjundaswamy, A. M.; Moorthy, N. V. N.
Indian Food Packer 27 (1) 5-9 (1973) [17 ref. En] [Central Food Tech. Res. Inst., Mysore-13]

Coorg monsoon mandarins were dipped in 1000 ppm Ethrel (2-chloroethyl phosphonic acid) for 5 min and then dried, treated with smoke for 24 h, or used as control after dipping in water before storage at 24-28°C and 68% RH. Ethrel treatment resulted in significant colour development and reduction in chlorophyll content during storage. No Penicillium infection was noted in Ethrel-treated and smoked fruits. Physiological loss in wt. was max. in smoked fruit (27.08% after 24 days storage) and least in Ethrel-treated fruits (20.39%). A reduction in acidity occurred in Ethrel and smoke-treated fruits up to 12 days of storage (from 1.04% for control at 0 days to 0.72 and 0.73% for Ethrel and smoke-treated fruits respectively at 12 days). Treated fruits respired faster than controls up to 15 days. PG

22

Canning of smoked eel.
Kandoran, M. K.; Solanki, K. K.; Venkataraman, R.
Fishery Technology 8 (1) 98-100 (1971) [3 ref. En] [Central Inst. of Fisheries Tech., Sub-sta., Veraval, Gujarat St., India]

Fresh medium sized eels (Muraenesox talbonoides and M. cinereus) were rubbed with coarse salt and the slime removed, cut longitudinally in half and boned; fillets (18-19 × 2.5-3.0 cm) were washed, dipped in 10% brine for 15 min, drained, dried for 30 min in a tunnel dryer at 45-50°C, smoked for 8 h as previously described [FSTA (1974) 6 4R236], dried to various moisture contents and cut into pieces. With moisture <50%, skin was removed and pieces pre-cooked for 15 min at 0.49 kg steam pressure, drained and canned. With moisture >50%, fillets were pre-cooked in perforated trays, and skin removed, followed by canning. Canning involved filling with hot refined groundnut oil (85°C), exhausting for 10 min, seaming and processing at 1.05 kg steam pressure for 45 min. Canned samples were stored for 2 wk then examined chemically (moisture, salt, phenols, N, drip loss) and organoleptically (colour, odour, flavour, texture). Smoked samples were similarly examined before canning. Results indicated that moisture increased on canning; 42-54% (depending on moisture level) of steam-volatile phenols were expelled on canning. Non-volatile phenols were also reduced during canning. Drip increased with increasing moisture prior to pre-cooking. Organoleptic properties were related to moisture content of smoked fillets; ranging from soft, crumbly, excessively juicy product at high moisture (e.g. 66.6%) to tough juiceless product at low moisture (e.g. 32.07%). Optimum moisture was judged to be about 52%. Storage life increased as moisture content decreased e.g. 10 months with 50% moisture on canning. JA

[Method for smoking brisling.]
Danielsen, O.; Tou, P. S. (Chr. Bjelland & Co. AS)
Norwegian Patent Application 128 356 (1973) [No]

Sprats or young herring or the like are smoked by introducing into the smoking chamber a mixture of hot air and smoke, preferably at 110-120°C and a speed of 10-15 m/s. A mixture of recycled air and fresh air at a ratio of 10:1 to 5:1 is used. W&Co

23

[Modern technology in manufacture of meat products.] Neuzeitliche Technologien bei der Herstellung von Fleischwaren. [Lecture]
Wirth, F.
Fleischwirtschaft 54 (2) 179-180, 182-183 (1974) [23 ref. De] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Blaich 4, Federal Republic of Germany]

Modern techniques allowing greater uniformity, faster processing and improved shelf-life of meat products are reviewed including vacuum or inert gas (N_2) grinding to prevent oxidative deterioration of colour, flavour and consistency; HTST sterilization of canned sausages; additives (phosphates, protein emulsifiers, high-level salting); controlled atm. smoking and drying; steam-smoking processes; microbial starter cultures; and process control by means of physical parameters (pH, water activity, F-value, redox potential). RM

24

[The composition of smoking preparations.] Zur Zusammensetzung von Räuchermitteln.
Potthast, K.
Fleischwirtschaft 54 (2) 183-184, 186 (1974) [9 ref. De] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Blaich 4, Federal Republic of Germany]

The use of smoke condensates in meat products was studied. 12 commercial smoke preparations contained <0.05-2600 µg/l. 3,4-benzpyrene, <1.0-219.46 g/l. phenols, 0.55-103.68 mg/ml acids, and 1.0-168.0 mg/ml carbonyls. In general, high concn. of the important phenolic flavour components (e.g. guiacol) was associated with high 3,4-benzpyrene concn. Frankfurter-type sausages made with 4 different smoke condensates (1 ml/100 g meat + fat mixture) had practically no smoked smell or flavour with condensates containing <1.0-4.06 g/l. phenol (<0.05-0.07 µg/l. 3,4-benzpyrene), and smoked, tarry and phenolic flavour and smell with 49.94-219.46 g/l. phenol (0.47-22.0 µg/l. 3,4-benzpyrene); conventionally smoked products had pleasant colour, flavour and smell and up to 0.2 parts/billion 3,4-benzpyrene. The carbonyl flavour components caused considerable loss of lysine (up to 45%) without producing satisfactory smoked aroma. Another disadvantages of using smoke preparation is due to their even distribution through the product, compared to their concn. in surface layers (and possible removal by peeling) after conventional smoking. RM

25

[Use of warm meat in the production of smoked meat products.]
Proselkova, T.; Bagraeva, G.
Myasnaya Industriya SSSR 44 (5) 17-18 (1973) [Ru]

It was found that the yield and quality of rolled meat products made from warm pork were higher than those of products made from cold pork. Tables of values are given for the pH, moisture content and organoleptic properties of the products. STI

26

[Modern production and storage of dry sausage.] Rohwurst heute: Herstellung und Lagerung.
Coretti, K.
Fleischwirtschaft 54 (2) 170-173, 176 (1974) [De] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Blaich 4, Federal Republic of Germany]

Manufacture of dry smoked sausages is explained, with detailed discussion of composition, additives (NaCl, curing salts, sugar, curing aids, ascorbic acid, glutamic acid, starter cultures and glucono-δ-lactone), the nature of the raw material (with special reference to pale soft exudative and dark firm dry pork), maturation, pH, firmness of the fat, grinding and mixing methods, and maturation, drying, smoking and storage of the sausages. Development of colour and flavour during slow, rapid and brine maturation of sausages is discussed. The importance of temp. and RH control during maturation, smoking and storage of sausages is emphasized. RM

27

[Technology of accelerated production of smoked meat products manufactured from warm pork.]
Mitsyk, V.; Firger, I.; Stopchik, R.
Myasnaya Industriya SSSR 44 (3) 21-24 (1973) [13 ref. Ru]

It was found that salting of warm meat gave better results than salting of cold meat in the manufacture of smoked meat products. Use of warm meat gives reduced losses and increased yield of finished products, as a result of reduced evaporation and improved water-binding capacity. STI

28

Determination of benzo(a)pyrene in smoke condensates by high pressure rapid liquid-liquid chromatography.
O'Hara, J. R.; Chin, M. S.; Dainius, B.; Kilbuck, J. H.
Journal of Food Science 39 (1) 38-41 (1974) [13 ref. En] [Stange Co., 342 N. Western Avenue, Chicago, Illinois 60612, USA]

Published methods for analysis of benzo(a)pyrene in smoke condensates involve a

lengthy sample preparation followed by spectrophotometric estimation of the content of the carcinogen. A more efficient method has been developed in which the benzo(a)pyrene is extracted from the smoke condensate, washed with acid and alkali solutions, eluted from a Florisil column, isolated by preparative TLC, and quantitized on a Liquid-Liquid Chromatograph at 254 nm. The range of recovery is 60-88%.   IFT

29

Smoked flavours.
Hercules Powder Co. Ltd.
British Patent 1 342 886 (1974) [En]

Emulsified smoke flavour compositions are derived from wood smoke and contain casein as a stabilizer.   IFT

30

Isolation and identification of the components of the tar of hickory wood smoke.
Hruza, D. E., Sr.; Praag, M. van; Heinsohn, H., Jr.
Journal of Agricultural and Food Chemistry 22 (1) 123-126 (1974) [17 ref. En] [International Flavors and Fragrances Inc., Union Beach, New Jersey 07735, USA]

The volatile components of hickory wood tar were fractionated by preparative has chromatography. Individual fractions were analysed on a Carbowax 20M 50 ft × 0.02 in support coated upon tubular column (SCOT) coupled to a mass spectrometer. The following compounds are among those being reported for the first time from hickory wood tar: 2-methyl-2-butenoic acid; benzaldehyde; 2-acetylfuran; 2-cyclohexenone; 4-propylguaiacol; 4-methylveratrol; 3-methyl-2-cyclopenten-1-one; 2,3-pentanedione; acetophenone; resorcinol; vinylphenol; 2,6-dimethylphenol; and 2-ethylphenol. A total of 6 aldehydes, 8 ketones, 4 esters, 6 furans, 12 aromatic hydrocyrbons, 32 phenols, and 13 acids were identified.   AS

31

[Comments on new meat regulations.]
Anmerkungen zur neuen Fleisch-Verordnung.
Kreuzer, W.; Ring, C.; Kotter, L.
Schlacht- und Viehhof-Zeitung 73 (9) 328-333 (1973) [De, fr] [Bereich Hygiene und Tech. der Lebensmittel Tierischen Ursprungs, Univ., Munich, Federal Republic of Germany]

The new regulations for meat and meat products in the Federal Republic of Germany are critically discussed, including regulations for the following aspects: cutting aids for use in sausage manufacture; use of calcium citrate for control of coagulation of blood; substances for use in the manufacture of edible synthetic sausage casings; antioxidants in edible fats of animal origin; use of talcum powder for surface treatment of non-edible casings of air-dried sausages; smoking of meat products; use of KNO_3; changes in the list of prohibited additives; and changes in the labelling regulations.   AJDW

32

[Development of world trade: animals, meat, meat products.] Entwicklung des Welthandels: Tiere, Fleisch, Fleischerzeugnisse.
Food & Agriculture Organization
Fleischwirtschaft 53 (7) 949-953; (8) 1089-1090; (9) 1231-1236; (10) 1406-1411 (1973) [De]

Data, taken from Vol. 25 of the FAO Trade Yearbook, are given for 1965-1970 for world trade in the major types of meat (fresh, frozen or dried, salted or smoked, and including poultry and offal) and a wide range of meat products.   RM

33

[Cheesemaking crafts of the Arges river region applied to industrial production.]
Patrascu, C.
Industria Alimentara 24 (7) 380-381 (1973) [Ro, en, fr, de, ru] [Intreprinderea de Ind. Laptelui, Pitesti, Rumania]

The following traditional cheeses of the Arges river region are now produced industrially in the 'Lactar' dairy factory in Pitesti: Brusturet, a smoked cows' milk cheese with eyes, in 1-1.5 kg loaves with straight or rounded edges and containing on average 48% moisture, 46% fat in DM and 2% salt; Rucar cows' milk Kachkaval cheese in waxed 250-500-g loaves, containing on average 44% moisture, 45% fat in DM and 3.5% salt; and Arges cows' milk Bryndza salted after ripening for 4-5 days, finally ripened for 15-20 days at 15°C and packaged in film, skin or fir bark.   SKK

34

Smooth, white spread from separated fish flesh forms a base for flavoured dips, snack items.
Patashnik, M.; Kudo, G.; Miyauchi, D.
Food Product Development 7 (6) 82, 87, 89, 91 (1973) [4 ref. En] [Nat. Marine Fisheries Service, Pacific Fishery Products Technology Center, Seattle, Washington, USA]

Headed, gutted fish enter the flesh separator at the crusher roll, are conveyed between a rotating stainless steel perforated drum and a continuous rubber belt under tension. The relatively soft muscle is squeezed through perforations in the drum while the skin and bones mat on the drum's outside and are scrapped off into a waste chute. Strained muscle passed through 2 mm openings, is used to prepare smooth-textured, spread-type products. 4 types of spreads, a white unflavoured base and 3 flavoured (scallop, chive or smoke) or coloured spreads were prepared and the product filled into cans, jars or other containers, pasteurized by steam or water at 185°F, quickly cooled and stored at ≤38°F. The formulation permits diversification into dips or fried snack items with only slight modification of ingredients or processing. Panelist evaluation of the 3 spreads comparing preference before storage with

preference after storage (2 months at 38°F followed by 16 months at 0°F) is given in tabular form. The basic spreads demonstrate a concept for diversified use of finely minced fish muscle in fabricated foods. VJG

35

Unconventional sources of fish protein.
Olley, J.
CSIRO Food Research Quarterly **32** (2) 27-32 (1972) [47 ref. En] [Div. of Food Res., CSIRO, Tasmanian Regional Lab., Hobart, 7000, Australia]

Utilization of waste products (namely fish viscera) is discussed. Unconventional sources of fish protein considered are: fish sausage, fish protein concentrate, smoked press-cake, and fish sauces and pastes. VJG

36

[The impact of smoking and the content of carcinogens in meat products.]
Filipovic, J.; Karakas, R.
Hrana i Ishrana **14** (9/10) 447-454 (1973) [18 ref. Sh, en] [Jugoslovenski Inst. za Prehrambenu Ind., Novi Sad, Yugoslavia]

Determination of 3,4-benzopyrene and other carcinogenic polycyclic hydrocarbons in smoked meat products is discussed with special reference to UV spectroscopic and fluorometric techniques. The effects of smoking method, packaging and the degree of comminution of ingredients on the carcinogen content of sausages and other smoked meat products are discussed, and details are given of the concn. of carcinogens in various foods. IN

37

[Separation of meat from bones by means of cryogenic liquids.]
Kaukhchesvili, E.; Ilyukhin, V.; Ermakov, Yu.
Myasnaya Industriya SSSR **43** (12) 42-43 (1972) [7 ref. Ru] [Moskovskii Tekh. Inst. Myasnoi Promyshlennosti, Moscow, USSR]

Non-boned meat is frozen with liquid N, finely crushed and transferred to a liquid of low temp. and high sp. gr. (e.g. one of the freons); bone particles sink, while meat particles float. The resulting comminuted meat may be used in the manufacture of smoked products. STI

38

[Some analytical and practical aspects of the contamination of smoked meat products by carcinogenic compounds. Results of analysis.]
Luks, D.; Lenges, J.
Revue des Fermentations et des Industries Alimentaires **28** (3) 111-114 (1973) [Fr, nl] [Service de Tech. Alimentaire, IIF-IMC, CERIA, 1070, Brussels, Belgium]

The estimation of the carcinogenic compound 3,4-benzpyrene in smoked meats is described. 500 g of minced meat is extracted with methanol and then with cyclohexane. The polycyclic hydrocarbon fraction is obtained by further liquid-liquid extraction using cyclohexane, methanol and N-N dimethylformamide as solvents. After concn. and purification on a column of silica gel and alumina, the band of 3,4-benzpyrene (obtained by TLC separation) is eluted with cyclohexane and the total amount present is determined spectrofluorimetrically. Analysis of 24 different Belgian smoked meats showed that the 3,4-benzpyrene content ranged from 0.00-0.39 ppb. The max. permitted level in W. Germany is 1 ppb. Analysis of 3 samples of smoked fish showed that these contained much higher levels of 3,4-benzpyrene than the smoked meats (smoked mackerel, 7.05; smoked sprats, 0.9 and kipper fillets, 0.32 ppb). MEG

39

[Method of obtaining a smoking liquid.]
Rusanov, V. V.; Lapshin, I. I.; Ignat'ev, V. I.; Davydov, Yu. S.; Tupitsyn, V. A. (Union of Soviet Socialist Republics, Moskovskii Institut Narodnogo Khozyaistva im. G. V. Plekhanova)
USSR Patent 418 163 (1974) [Ru]

Smoke particles are passed through an electro-filter, preferably at 2.5-3 m/sec, to precipitate the larger particles and to impart a charge to the smaller particles, which are then trapped in a solvent. In order to more fully utilize the smoke particles and to improve liquid quality, the solvent is beaten into a disperse phase and given an opposite charge to the particles. W&Co

40

[Infestation of foods of animal origin by Toxoplasma gondii.]
Sibalic, D.
Hrana i Ishrana **14** (7/8) 337-343 (1973) [45 ref. Sh, en] [Inst. za Med. Istrazivanja - Odeljenje za Parazitologiju, Belgrade, Yugoslavia]

Survival of Toxoplasma gondii during cooking and processing was investigated. Cysts in meat could be destroyed by heating at 50°C for 30 min, or by salting or smoking. Toxoplasma cysts survived in pork for 10-30 days at 4°C, in milk for 5 days at 5°C, for 4 wk in the yolk of eggs at 4°C, and for 2 wk in the albumen of eggs at 4°C. IN

41

[The technology of manufacture of smoked fish products.]
Verkhoturova, F. I.
Rybnoe Khozyaistvo No. 10, 67-69 (1973) [Ru] [AtlantNIRO, USSR]

Details are given of processes developed for the manufacture of smoked fish, whale meat and mixed fish/whale meat products. Smoked minced fish products contain 25-30° protein and ≤23% fat; their keeping quality at 8-10°C is excellent. Five mixture containing salted whale meat were evaluated; details are given of the composition of the best mixture. The storage life of the smoked products ranges from 20 to 90 days, depending on the raw materials. STI

42

Macrae's new Fraserburgh kippering plant.
Anon.
Food Trade Review 43 (11) 15-17 (1973) [En]

The new herring processing plant at Fraserburgh, Scotland combines in one place the previously scattered kippering and canning operations. Details are given of the following aspects of herring processing: receipt and preparation; smoking; packaging of kippers; freezing; fish preparation for canning; washing and brining; canning; sterilization; packaging and warehousing. VJG

43

[Polycyclic carcinogenic compounds in meat products, and toxic trace elements in meat.]
[Lecture]
Hamm, R.
Medycyna Weterynaryjna 29 (12) 709-715 (1973) [Pl] [Federal Me[illegible], Kulmbach, Federal Republic of Germa

This lecture presented at a scientific meeting of the Committee for Veterinary Sciences of the Polish Academy od Sciences in June 1973 in Warsaw deals mainly with the studies at the Kulmbach Institute on the presence of polycyclic hydrocarbons (including benzo[a]pyrene) in smoked meat products, smoke-flavour preparations and some vegetables, cereals, bakery products and oils and fats; together with the presence of toxic and other trace elements in pig meat, veal and beef. SKK

44

An old plant renews itself.
Gray, M. H.; Devendorf, D.
Food Engineering 46 (1) 78-80 (1974) [En] [Stark, Wetzel Foods, Indianapolis, Indiana, USA]

The first stage in the reconstruction of Stark, Wetzel Food's meat processing plant in Indianapolis is described. It involved the construction of a 60 000 ft^2 straight through-flow plant. Details of construction are outlined and descriptions given of processing and refrigeration equipment. This includes 3 continuous thermal tunnels (Gadd Ind.), one for wieners, bolognas and smoked sausages, the second for smoked meats and the third for bacon. Computerized controls automate the various process cycles. The refrigeration plant employs 2 evaporator systems; frankfurters are chilled with brine sprays, other products with conventional No-Frost spray coolers. All holding rooms are maintained at 28°F and 80% RH; processing areas at 36-40°F and 48% RH. Maintenance problems have been greatly reduced in this new plant. JA

45

[Influence of smokeroom conditions on products when smoking Frankfurter-type sausages.]
Einflussmöglichkeiten der Räucherkammer auf die Produkte beim Räuchern von Brühwurst.
Lange, W.
Fleischwirtschaft 54 (4) 746-748, 751 (1974) [4 ref. De, en, fr] [Rheinberger GmbH u. Co. KG, 2000 Hamburg 50, Jessenstrasse 13, Federal Republic of Germany]

The theoretical basis of the effects of smoking conditions on quality characteristics of Frankfurter-type sausages is discussed. Equations were derived for predicting the effects of smoking conditions and tables are given to allow quick determination of the core temp. and wt. loss during drying, smoking, cooking and cooling of sausages of 20-80 mm diam. at 40-70°C dry temp. and 30-65°C moist temp. Suggestions are made for optimum processing methods. RM

46

Identification of flavour constituents in carbonyl, non-carbonyl neutral and basic fractions of aqueous smoke condensates.
Kim, K.; Kurata, T.; Fujimaki, M.
Agricultural and Biological Chemistry 38 (1
(1974) [9 ref. En] [Dept. of Agric. Chem., Fac. of Agric., Univ. of Tokyo, Japan]

Carbonyl, non-carbonyl neutral and basic fractions obtained from commercial aqueous smoke condensates were separated by GLC and/or silica gel column chromatography. 98 constituents were identified (31 compounds had not been previously reported in smoke condensate) and 22 were tentatively identified on the basis of retention times on GLC, and IR, MS (GLC-MS) and NMR data. The yields of all the smoky aroma constituents (4 aliphatic alcohols, 5 aliphatic ketoalcohols, 6 aliphatic ketones, 20 cyclic monoketones, 3 cyclic diketones, 10 acids, 2 esters, 12 lactones, 9 furan derivatives, 6 N-compounds, 4 aromatic hydrocarbons, 2 aromatic alcohols, 9 aromatic carbonyls, 24 phenols and phenol ethers and 5 pyrocatechols) detected in commercial wood vinegar were estimated. AS

47

Analysis and comparison of flavor constituents in aqueous smoke condensates from various woods.
Fujimaki, M.; Kim, K.; Kurata, T.
Agricultural and Biological Chemistry 38 (1) 45-52 (1974) [11 ref. En] [Dept. of Agric. Chem., Fac. of Agric., Univ. of Tokyo, Japan]

The nature of commercial smoke condensates (wood vinegar liquors) obtained from 6 kinds of wood [2 oaks, cherry, pine, Japanese cedar, bamboo] was studied in relation to their flavours. Undistilled smoke condensates had an unpleasant resin-like odour, while distilled ones had a strong pungent smoky flavour mixed with cresolic and furfural-like odours. These differed slightly with the various kinds of wood. Among the 6 woods, one oak (Quercus acuta) and bamboo gave organoleptically the most acceptable smoke flavours. The amounts and compositions of flavour components in the carbonyl, non-carbonyl neutral, basic, acidic and phenolic fractions contributed to the differences in aroma. In particular, the composition of the phenolic fraction was thought to be important. AS

48

[Pork products: hot-smoked.]
Union of Soviet Socialist Republics,
Gosudarstvennyi Komitet Standartov
Soviet Standard **GOST 18256-72** 5pp. (1972) [Ru] [Moscow, USSR]

This standard, which is valid until July 1, 1978, applies to hot-smoked pork products (bacon, ham, breast, leg, roulade), which must contain ≤2.5% salt and ≤3.0 mg/100 g sodium nitrite. The standard also covers reception, packaging, transport and storage (0-8°C, 75-80% RH for ≤5 days). HBr

49

The fishing industries of Denmark and Greenland.
James, D. G.
CSIRO Food Research Quarterly 33 (3) 49-58 (1973) [En] [Div. of Food Res., CSIRO, Hobart, Tasmania]

Aspects of the Danish fishing industry considered are: the catch; handling methods; processing; marinades; smoking; gravad fish (cut surfaces of fillets, lightly salted and with added dill and spices); trout; shrimp; mussels; fish inspection service; fish research; and the future of the industry. The catch of the Greenland fishing industry and its treatment are considered. VJG

50

[Changes in the lipids of Notothenia rossi during the production of smoked dried products.]
Lapshin, I. I.; Shevchenko, M. G.
Rybnoe Khozyaistvo No. 6, 73-75 (1973) [Ru] [Moskovskii Inst. Narodnogo Khozyaistva imeni G.V. Plekhanova, USSR]

Details are given of studies on changes in lipids of Notothenia rossi (an Antarctic fish) during manufacture of smoked dried products. Tables of values are given for the concn. of various lipid fractions. Total lipid, phospholipid and monoglyceride content decreased during processing; free fatty acid content increased. The correlation of changes in the relative proportion of lipid fractions with the peroxide value, iodine number and acidity number of the products is discussed. STI

52

Sydney fish smoking factory to market variety of products.
Anon.
Australian Fisheries **33** (4) 31-32 (1974) [En]

Brief details are given of the equipment and operation of the new smoked sea-food factory of Smoked Foods Pty. Ltd., at Brookvale, North Sydney, Australia. Products include smoked and breaded fish and prawns. At present, the products are chilled and vacuum packed; a liquid N freezer is, however, to be installed. AJDW

53

Effect of smoking temperatures on acceptability and storage stability of smoked Spanish mackerel.
Deng, J.; Toledo, R. T.; Lillard, D. A.
Journal of Food Science **39** (3) 596-601 (1974) [18 ref. En] [Food Sci. Dept., Univ. of Georgia, Athens, 30602, USA]

Effect of temp. and smoking on quality of Spanish mackerel was evaluated using a pilot plant model of a commercial smokehouse. Although final moisture contents of products are the same, the product smoked only at high temp. (160°F) had softest texture. Smoking at low temp. (100°F) did not produce surface colour thus resulting in poorest appearance. A process which combined smoking at both low and high temp. at 60-364 RH gave a product having excellent texture and appearance. Smoking above 160°F darkened the surface excessively and reduced product acceptability. Holding after brining and between cold and hot smoking improved appearance and smoke flavour. Water phase salt content judged to be optimum saltiness was 3.7%. Microbiological counts in the product of combination cold and hot smoking were very low (<10/g). Smoking at 90-100°F did not allow any increase in surface microbiological count. The final step in the process, when carried out at 160°F, inactivated most vegetative microorganisms inoculated on the surface. Storage life of Spanish mackerel produced by cold followed by hot smoking was 45 days at 38°F and 22 wk at 10°F. The process does not meet the 30 min at 180°F min. temp. requirement in the Good Manufacturing Practice Regulation of the US FDA for smoked fish; therefore, frozen storage and distribution are recommended. IFT

54

Production of staphylococcal enterotoxins in smoked sausage.
Tatini, S. R.; Thota, H.
Abstracts of the Annual Meeting of the American Society for Microbiology **73**, 12 (1973) [En] [Univ. of Minnesota, St. Paul, USA]

Production of enterotoxins (A, B, C, D) by Staphylococcus aureus during manufacture of smoked sausage was determined by inoculating a commercially prepared sausage mix (pre-extrusion) with Staph. aureus (3 × 10^5 and 3 × 10^7/g) and stuffing into cellulose sausage casing. The sausage links were smoked for 0-8 h at 50°C (product temp. about 32°C). Samples of sausage were taken at 0 and 3 h and at hourly intervals between 4 and 8 h. Viable Staph. aureus population was determined by plating on Baird-Parker and Trypticase Soy Agar (containing 7.5% NaCl) media. Presence of enterotoxins was detected serologically by a microslide method. The viable Staph. aureus (3 strains) population showed only a 2-fold increase (during 8-h smoking) in sausage inoculated with 3 × 10^7/g. Enterotoxins A, C and D were detected within 3 h of smoking in sausage with 3 × 10^7/g and not in sausage with 3 × 10^5/g even after 8 h. Enterotoxin B was not detected in any sausage even after 8 h smoking. Toxins A, C and D persisted during cooking of the sausage (after smoking) to an internal temp. of 60°C. AS

55

[Effect of consistency of the filling on accumulation of volatile reducing substances and volatile fatty acids during production of meat products with a long shelf life.]
Fong, L.; Kostov, K.
Nauchni Trudove, Vissh Institut po Khranitelna i Vkusova Promyshlennost **19** (1) 165-172 (1972) [21 ref. Bg, ru, de]

The filling for Cervelat type sausages and the sausages themselves were analysed for contents of (i) volatile reducing substances and (ii) volatile fatty acids immediately after manufacture of the filling and after browning, smoking and drying for 4, 8 and 12 days. The sausages were 0.40 ± 0.01 m long, 0.060 m in diam. and, to alter the consistency (density), were filled with 1000, 1200 or 1400 g filling. Results are tabulated. The density had an effect at all production stages, the concn. of (i) and (ii) both in the centre and the periphery of the sausages increasing with increasing density. HBr

56

[The effect of bacterial inoculum on fat quality in raw-smoked salamis.]
Buyanov, A. S.; Slepykh, G. M.
Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 4, 62-65 (1973) [8 ref. Ru] [Moskovskii Tekhnologicheskii Inst. Myasnoi i Molochnoi Promyshlennosti, USSR]

Details are given of studies on the effects of inoculation with Lactobacillus plantarum or a mixture of Streptococcus lactis, Str. diacetilactis and Str. paracitrovorus on chemical changes in the fat in raw smoked salamis. Results showed that the inocula retarded the onset of oxidative changes and accumulation of free fatty acids; rates of increase of acidity numbers and peroxide numbers were increased, and iodine number decreased, as compared to control samples. STI

57

[Specialization in smoked meat products manufacture.]
Krasnov, S. E.; Razinkov, N. F.
Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No.6, 15-18 (1973) [Ru] [Moskovskii Tekh. Inst. Myasnoi i Molochnoi Promyshlennosti, USSR]

As a result of specialization, the number of individual kinds of products manufactured at some plants decreased from 7.2 to 2.8. The use of modern machines and equipment and specialized production lines for the manufacture of various types of sausages, cooked smoked meat products and smoked meat has increased by 100 %, in the case of semi-smoked products by 86 % and in the case of liver sausages by 90 %. Higher specialization allows better management and planning and the application of modern mathematical methods of planning and management. STI

58

Effect of smokehouse temperature, humidity and air velocity on rate of heating and quality of frankfurters.
Monagle, C. W.; Toledo, R. T.; Saffle, R. L.
Journal of Food Science 39 (3) 602-604 (1974) [13 ref. En] [Food Sci. Dep. [illegible] Univ. of Georgia, [illegible]

Effects of air velocity, RH, temp. and presence of glucono-delta-lactone (GDL) on quality of frankfurters were evaluated. Rate of heating was inversely proportional to rate of weight loss during processing. High humidity processes at slow air flows had fastest heating rates; however, quality was unacceptable because of fat separation and pale colour. A process where smokehouse temp. was slowly increased by 6°C increments, and where low RH and high air flow were used, gave the best quality. Colour and texture were more desirable on products having higher shrink. Presence of GDL had no effect on final colour of products processed under the same conditions; however, max. colour appeared to develop earlier in samples containing GDL. IFT

59

[Smoke flavours.]
Iwatare, S.
Japanese Patent 4 908 866 (1974) [Ja]

Pyroligneous acid is allowed to stand to resinate the carbonyl compounds with the phenols. After separation of the resinated solids, the liquid is distilled at temp. below the mp of the carinogenic substances, and the distillate is allowed to stand to precipitate additional solids. IFT

60

Liquid smoke.
Goblik, V. F.; Kotsur, V. G.; Repnyakova, V. A.; Mel'nikova, L. M.; Kovach, L. I.; Gorbatov, V. M.; Volovinskii, V. P.; Krylova, N. K.; Lyaskovskaya, Yu. N.
United States Patent 3 806 609 (1974) [En]

A preneutralized aqueous smoke condensate is distilled to yield 2 fractions within the boiling range of 98-105°C. The 1st fraction is treated with adsorbents to yield a composition having curing components, which is mixed with the 2nd fraction to form a liquid smoke. IFT

61

[The trend from labelling with the shelf-life to labelling with the date of manufacture. A problem in labelling of vacuum-packaged smoked fish.] 'Hin [illegible]haltbarkeitsdatum' und 'weg vom

Herstellungsdatum'. Ein Kennzeichnungsproblem bei vakuum-verpackten Räucherfischen.
Schwarz, J.
Allgemeine Fischwirtschaftszeitung 26 (13) 13-14 (1974) [De]

The relative merits of labelling of vacuum-packaged smoked fish products with the date of manufacture or the last recommended date for consumption are discussed; both are permitted in the Federal Republic of Germany. It is concluded that, due to problems of accurate evaluation of shelf-life by retailers and consumers, labelling with the last recommended date for consumption is preferable. AJDW

62

Reduction of mercury in sablefish (Anoplopoma fimbria) and the use of the treated flesh in smoked products.
Teeny, F. M.; Hall, A. S.; Gauglitz, E. J., Jr.
Marine Fisheries Review, National Oceanic and Atmospheric Administration 36 (5) 15-19 (1974) [5 ref. En] [Pacific Fishery Products Tech. Center, Nat. Marine Fisheries Service, NOAA, Seattle, Washington 98112, USA]

Extraction of Hg from sablefish muscle by treatment with L-cysteine hydrochloride monohydrate solution was investigated; variable factors studied included: degree of comminution of the fish (chunks, slices or ground fish); cysteine concn. (0.2-1.0%); pH (3-9); number of extractions (1 or 2); ratio of fish wt. to cysteine solution vol. (1:0.5-1:5); treatment temp. (2 or 20°C) and contact time (≤60 min for ground fish, ≤72 h for chunks and slices). Extracted samples were hot smoked. Tables and graphs of results are given. Results showed that reduction of the Hg concn. by ≤80% is possible; the efficiency of Hg removal increased with increasing cysteine concn., temp., degree of comminution and number of extractions. The yield (dry basis) of hot-smoked extracted product was highest for chunks (96%) and lowest for ground fish (73%). The organoleptic properties of the extracted product did not differ significantly from those of non-extracted control samples. AJDW

63

[Outer mass exchange during the cooling and storage of smoked meat products.]
Yushkov, N. A.; Chizhov, G. B.; Chistyakov, V. V.
Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 6, 110-112 (1973) [3 ref. Ru] [Stavropol'skii Politekhnicheskii Inst., USSR]

Mass transfer processes in smoked meat products were studied, with the aim of developing improved cooling and storage methods. Smoked products in cellophane casings had a mean evaporation resistance coeff. of 5.0; products in natural casings had a mean evaporation resistance coeff. of 2.4. Hourly moisture loss from products in cellophane casings was 0.4-0.8 g/kg; the corresponding values for products in natural casings was 0.6-1.7 g/kg. The evaporation resistance coeff. of homogeneous smoked sausages depends primarily on the thermophysical properties of the casing. The rate of water loss depends on the properties of the product, the density of the sausage meat, perforation of the casing and the flow rate of the surrounding air. STI

64

Accelerated pork processing: a quantitative study of bacterial flora of cured and smoked hams.
Cornish, D. G.; Mandigo, R. W.
Journal of Food Science 39 (3) 605-606 (1974) [11 ref. En] [Animal Sci. Dept., Univ. of Nebraska, Lincoln, 68503, USA]

96 hams (48 left and right pairs) were assigned to either accelerated or conventional processing following separation from their respective sides at a commercial slaughter plant. Bacteriological survey samples were aseptically removed from accelerated and conventionally processed hams prior to curing. A second bacteriological sample was removed from both rapid and conventional treatments following curing, smoking and chilling. Total bacterial counts were then determined on both fresh and cured muscle tissue. Effect of different processing techniques was evaluated by bacterial flora present in rapid and conventionally processed hams. Aerobic bacteria (15°C and 37°C), anaerobic bacteria (37°C) and anaerobic sporeformers were analysed statistically. Anaerobic sporeformers were estimated by the MPN method. No significant differences ($P < 0.01$) were found between rapid or conventional processing techniques in total aerobes and anaerobic sporeformers in fresh or cured muscle tissue. Total anaerobes were significantly greater ($P < 0.05$) in conventional processing when compared to rapid processing. Results reveal no significant bacteriological problems in rapid processing of pork prior to initial chilling. IFT

65

Nitrosation of phenols in smoked bacon.
Knowles, M. E.; Gilbert, J.; McWeeny, D. J.
Nature, UK 249 (5458) 672-673 (1974) [7 ref. En] [Food Sci. Div., Min. of Agric., Fisheries & Food, Colney Lane, Norwich, NOR 7OF, UK]

Bacon samples from traditional smoking and from spray-smoking processes were examined for nitroso- and nitrophenols. Samples were examined raw and fried and after simulated gastric digestion. Both processes resulted in the deposition of phenols (mainly cresols, guaiacols and syringols) in the meat matrix. GC analysis of green bacon showed no significant nitrogen-containing peaks. 6-nitro-m-cresol was found in the raw and fried traditionally-smoked bacon and in the fried, spray-smoked bacon and its cooking volatiles. 6-Nitroguaiacol was found in the spray-smoked bacon volatiles, and 6-nitro-3 methyl

volatiles of both bacons. The results indicate that nitrite reacts with a wide variety of smoke phenols in bacon during production, frying and simulated gastric digestion. CRI

66

[Device for cleaning of smokehouses.]
Geller, A.
Myasnaya Industriya SSSR 44 (8) 28-29 (1973) [Ru] [Magnitogors: at, USI]

Brief details are given of the operating principles of a vibration device for removal of dirt deposits from smokehouse walls. STI

[Process for the smoke-aromatisation of meat products.] Verfahren zum Raucharomatisieren von Fleischwaren.
Henning, W.
German Federal Republic Patent Application 2 235 132 (1974) [De]

A tarry smoke condensate obtained from wood or similar smoking agents, especially beechwood, is converted to a dry product by mixing with salt and absorbent flours and is subsequently blended with freshly smoked free-flowing meat product additives, e.g. pulverised protein hydrolysates, sodium glutamate, herbs and spices. The mixture is finely ground and added to the meat used in the manufacture of, e.g. sausages. The beechwood condensate does not contain known carcinogenic substances, such as benzpyrene and dibenzanthracene, and its unpleasant odour is neutralised by the blending procedure. 15-25 parts by wt. of dried condensate are mixed with 75-85 parts of seasoning or flavouring additives. W&Co

67

[The water activity (a_w-value) as a criterion for evaluating smoked sausages.] Die Wasseraktivität (a_w-Wert) als Kriterium für die Beurteilung von Rohwurst.
Leistner, L.; Rödel, W.
Fleischwirtschaft 54 (6) 1039-1040 (1974) [9 ref. De] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Blaich 4, Federal Republic of Germany]

68

[Use of pure mould cultures for air-dried raw sausage.] Die Anwendung von Kultur-Schimmel bei luftgetrockneter Rohwurst.
Liepe, H.-U.
Fleischerei 25 (3) 60, 62 (1974) [De, en, fr]

Details are given of the use of 'Edelschimmel Kulmbach 72' (a pure culture of Penicillium nalgiovensis) for ripening of air-dried sausages. The sausages are dipped in a suspension of P. nalgiovensis immediately after filling, then ripened under normal conditions. Good results may be obtained with both natural and synthetic casings. The mould grows poorly on natural casings with a high fat content. With certain textile casings, initial mould growth is excellent, but the mould layer disappears after storage for approx. 3 months. The culture may also be used for lightly-smoked sausages; these should be washed before inoculation. Advantages claimed for the use of pure cultures include improvement of taste, flavour and keeping quality; control of toxigenic and other undesirable moulds and bacteria; prevention of surface drying, and protection of the sausage against adverse effects of light and O_2. AJDW

69

[Comments on the new meat regulations.] Anmerkungen zur neuen Fleisch-Verordnung.
Kreuzer, W.; Ring, C.; Kotter, L.
Fleischerei 24 (10) 61, 63, 66, 67 (1974) [De] [8 Munich 22, Veterinärstrasse 13, Federal Republic of Germany]

Changes in the regulations for meat and meat products in the Federal Republic of Germany, are critically discussed, with reference to: restrictions on the use of cutting salts in the manufacture of sausage emulsions and similar products; permission for use of calcium citrate for control of coagulation of blood; increases in the range of materials permitted for use in the manufacture of synthetic sausage casings; permission for antioxidant treatment of animal fats; use to talcum powder ($MgSiO_3$) for surface treatment of non-edible casings of air-dried raw surfaces; regulations for smoking of meat products, and the 3,4-benzpyrene concn. in smoked products; restrictions on the use of KNO_3; changes in the list of prohibited additives; and changes in labelling regulations. AJDW

70

[Production and utilization of curing smoke.] Entwicklung und Anwendung von Räucherrauch.
Fessmann, G.
Fleischerei 24 (11) 14-15 (1973) [De, en, fr] [Gerhard Fessmann, Germos, D-7012 Fellbach, Postfach 1347, Federal Republic of Germany]

The operation and applications of steam smoke generating units for meat, sausages etc. are discussed. Advantages claimed include: uniform smoking conditions; low concn. of 3,4-benzpyrene, as a result of the low smoke-generating temp. (approx. 300°C); reduced wt. loss of the products during smoking; stable colour and flavour of the product; easy control of air pollution by waste smoke; and control of surface mould growth on the smoked products. AJDW

71

[Industrial scale cooking and smoking of meat products. Experience with a continuous cooking and smoking unit.] Kochen und Räuchern im Industriebetrieb. Ein Erfahrungsbeispiel mit einer kontinuierlichen Koch- und Räucheranlage.
Klemm, W.
Fleischerei 25 (1) 34-35 (1974) [De, en, fr]

Brief details are given of the Fessmann 'Transfer 4000' continuous conveyor-type smoking and cooking unit (capacity 400-3000 kg/h) for a wide range of types of sausages. Cooking, smoking and cooling times and conditions may be varied to suit individual batches of sausages. Advantages claimed include low labour requirements, low space requirements, reduced costs and uniform product quality. AJDW

72

[Microflora variation in Polish raw smoked sausage during production and storage.]
Szczepaniak, B.; Pezacki, W.
Medycyna Weterynaryjna 30 (5) 278-282 (1974) [10 ref. Pl, ru, en] [Inst. Tech. Zywnosci Pochodzenia Zwierzecego, AR, Poznan, Poland]

Contents of gram positive and Gram negative rods, cocci, sporeformers, yeasts and moulds were determined in random samples of Polish raw smoked sausage taken from 3 batches at the sausage mix stage, and after filling, smoking and storing (at 10-15°C and approx. 85% RH) for 1, 3, 5 and 7 days. It is concluded from tabulated and graphically presented results that market variations between batches at the different stages of manufacture and storage were apparently due to mix contamination and multiplication of microorganisms in the initial phases; that at all stages, cocci formed the dominant type; that smoking resulted in destruction of Gram negative rods and yeasts; and that the total counts increased from approx. 1 million/g in the mix to 6-33 million/g at the end of storage, including ≤6000 sporeformers/g. SKK

73

Our food - past and present.
Sair, L.
Food Technology in Australia 26 (5) 192, 193, 195, 197 (1974) [En] [Griffith Lab. Inc., Chicago, Illinois, USA]

Changes in fresh meats that have occurred in the last 50 yr are largely in the preparation; precutting and packaging. Types of sausage products consumed have also remained unchanged, though changes in manufacturing have occurred such as replacement of nitrates by nitrite, arterial and stitch pumping, use of ascorbates or erythorbates, employment of antioxidants, liquid smoke, phosphates and cure accelerators, and use of vegetable proteins. PG

74

[Method for manufacture of smoked sausages.]
Marchenko, A. P.; Neeshkhlebov, A. I.; Dikshtein, M. A.; Vorob'ev, V. E. **(Union of Soviet Socialist Republics.** Kazakhskii Filial Vsesoyuznogo Nauchno-Issledovatel'skogo Instituta Myasnoi Promyshlennosti)
USSR Patent 426 646 (1974) [Ru]

The method includes treatment of intestinal casing with sorbic acid solution, to which potassium dihydroorthophosphate is added to prevent more effectively mould growth in the sausages. The casing is additionally treated with sodium sorbate solution and is then filled by injecting the meat. The treatment is preferably carried out at 30-40°C, the first solution contains 1-4 g/l. sorbic acid and 20-40 g/l. potassium dihydroorthophosphate, and the second solution contains 1-5% sodium sorbate. W&Co

75

[Approximate method for calculation of internal mass transfer during drying of raw smoked sausages.]
Brazhnikov, A. M.; Karpychev, V. A.; Slepykh, G. M.
Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 1, 123-126 (1973) [3 ref. Ru] [Moskovskii Tekhnologicheskii Inst. Myasnoi i Molochnoi Promyshlennosti, Moscow, USSR]

An equation is presented said to describe adequately the distribution of moisture in the meat part of contents of raw smoked sausage and the process of drying of this part in the drying chamber. SKK

76

[Changes in the lipids of Notothenia rossi during the production of smoked dried products.]
Lapshin, I. I.; Shevchenko, M. G.
Rybnoe Khozyaistvo No. 6, 73-75 (1973) [Ru] [Moskovskii Inst. Narodnogo Khozyaistva imeni G.V. Plekhanova, USSR]

Details are given of studies on changes in lipids of Notothenia rossi (an Antarctic fish) during manufacture of smoked dried products. Tables of values are given, for the concn. of various lipid fractions. Total lipid, phospholipid and monoglyceride content decreased during processing; free fatty acid content increased. The correlation of changes in the relative proportion of lipid fractions with the peroxide value, iodine number and acidity number of the products is discussed. STI

77

[The effect of fish postmortal stage on the quality of frozen hash and smoked products.]

Polyakova, L. K.; Rekhina, N. I.
Rybnoe Khozyaistvo No. 2, 66-69 (1974) [2 ref. Ru] [VNIRO, USSR]

The effects of the postmortem stage of fish on the water-holding capacity, shear value, organoleptic properties, processing characteristics, moisture content, pH, rheological properties and cutting stress limit of frozen comminuted products and smoked products were evaluated. The results showed that it is advisable to hold fish in ice or in cooled sea water during ageing. The storage life depends on fish species and storage conditions. STI

78

[The role of phenols in the MINCH liquid smoke preparation for treatment of fish.]
Lapshin, I. I.; Rodina, T. G.
Rybnoe Khozyaistvo No. 2, 75-77 (1974) [Ru] [Moskovskii Inst. Narodnogo Khozyaistva im. G.V.Plekhanova, USSR]

Phenols were determined in the volatile fraction (isolated by steam distillation) and the non-volatile fraction of the MINCH liquid smoke preparation. A total of 20 phenols were isolated from the volatile fraction, of which 12 were identified. The predominant constituents were methylguaiacol, guaiacol, m- and o- cresol, carbolic acid, and methyl esters and homologues of pyrogallol. The non-volatile fraction contained negligible quantities of phenols. Different fish species absorb different relative proportions of the various phenolic constituents of the liquid smoke preparation. Guaiacol, methylguaiacol, cresol and xylenol are responsible for the characteristic flavour and aroma of smoked fish. STI

79

Alternative uses of fish. [Review]
Burgess, G. H. O.
PAG [Protein Advisory Group] Bulletin 4 (2) 1-11 (1974) [81 ref. En] [FAO, Rome, Italy]

The subject is reviewed under the headings: Requirements of a fishery, Use of fish in developing countries, and Choice of products (traditional, modern, special and experimental, covering aspects such as nutritional value; processing of dried, salt, smoked, fermented, fresh and frozen fish; and fish protein concentrate). HBr

80

How to make jerky.
Field, R. A.
Bulletin, Agricultural Experiment Station, University of Wyoming No. 586, 6pp. (1973) [En] [Agric. Expt. Sta., Univ. of Wyoming, Laramie, Wyoming 82071, USA]

Methods of making jerky (dried strips of meat used for pemmican) are outlined, including: meat preparation, recipes for simple dry cured, pickle cured, hot pickle cured and marinated jerky and manufacture of jerky from dry cured and ground meat. A simple smokehouse is described. RM

81

[Method of producing coarse smoked German pork sausage and sausage produced according to this method.] Verfahren zum Herstellen von grober Mettwurst und nach dem Verfahren hergestellte Mettwurst.
Hartner, F. (Gewürzmüller Karl Müller & Co GmbH)
German Federal Republic Patent Application 2 300 297 (1974) [De]

Coarse smoked German pork sausage contains (by wt.) 30-50, preferably 40% chopped lean pork, 35-50, preferably 42% lean belly of pork and 10-30, preferably 18% pork fat preferably from belly or shoulder of pork. The sausage meat is prepared by mixing the chopped lean pork with spices and other additives such as glucono-δ-lactone, sugar, organic edible acids or ascorbic acid, resting the mixture for at least 1 h, then mixing in the finely chopped unseasoned pork fat which forms a coating around the individual lean meat particles. The chopped belly of pork is seasoned with salt and finally added to the mixture. Gel formation is greatly restricted, so that even after prolonged storage the sausage meat remains smooth and well bonded. W&Co

82

[Dried beef.]
Frentz, J. C.
Euroviande - Courrier des Abattoirs **15** (83) 19-20 (1974) [Fr]

Details are given of manufacture of the dried cured beef product 'Viande des Grisons' (also marketed as 'Bündner Fleisch'). Beef legs are trimmed carefully to remove fat and nerves, aged for approx. 1 wk, rubbed with a special mixture (containing NaCl, KNO_3 or $NaNO_3$, sucrose and spices), and dry-cured in stacks for 3-4 wk at 6-8°C, the stacks being turned at 3-5 day intervals. The meat is then rinsed, and held drying chambers at 10-15°C and 75-80% RH for 1-4 months. The dried meat is then pressed into rectangular blocks. A similar product 'Filet d'Anvers' is smoked during processing. AJDW

83

[Effects of smoke on moulds.] Untersuchungen zur Wirkung von Rauch auf Schimmelpilze.
Kersken, H.
Fleischwirtschaft **54** (8) 1341-1344, 1346 (1974) [33 ref. De, en, fr] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Blaich 4, Federal Republic of Germany]

The fungistatic effect of smoke on 6 species of mould frequently found on cured meat products (Cladosporium herbarum, Penicillium

chrysogenum, Mucor hiemalis, Aspergillus repens, A. Amstelodami and A. chevalieri) were studied in model experiments and on dry sausages. Model tests included exposure of culture plates to smoke at 26°C (producet at 300°, 350° or 400°C) before or after inoculation, and inhibitor tests (agar diffusion method) with smoke condensates. Fungistatic effect increased with temp. of smoke production, was much stronger if smoking followed inoculation and varied for different organisms: C. herbarium was the most sensitive, the 3 species of Aspergillus most resistant. With sausages, smoking under factory-type conditions (2½-3 h with smoke at 26°C, produced at 340°C) prevented germination of previously inoculated P. chrysogenum, C. herbarium and M. hiemalis spores during 21 days storage. Only C. herbarum was inhibited when inoculation took place after smoking, while Aspergillus spp. were again resistant; at 21 days, growth and sporulation was stimulated. [Continued in following abstr.] RM

84

[Effects of smoke on moulds.] Untersuchungen zur Wirkung von Rauch auf Schimmelpilze.
Kersken, H.
Fleischwirtschaft **54** (8) 1341-1344, 1346 (1974)
[33 ref. De, en, fr] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Blaich 4, Federal Republic of Germany]

[Continued from preceding abstr.] Supplementary smoking (2 h, smoke production temp. 400°) of a batch of factory-produced sausage prevented mould formation during 3 weeks storage in cartons at 12°C, 70-75% RH. The increased fungistatic effect with increasing temp. of smoke production was attributed to higher production of formaldehyde and phenols, which also explained gradual loss of activity due to volatility, diffusion and reaction with meat proteins. Some practical suggestions for preventing undesirable mould growth are included. RM

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33	Browning of Foods
34	Aflatoxins
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H. BROOKES
ASSISTANT EDITOR

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1

European challenge for the British sausage manufacturer.
Corlett, J. E.
FMF Review **9** (8) 6, 10 (1974) [5 ref. En] [C. & T. Harris Ltd., Calne, Wiltshire, UK]

With reference to the challenge of manufacturing in Britain sausages that European consumers will accept, an outline is given of the 4 basic categories of European sausage: fresh; pasteurized or 'scalded'; cooked; raw or dry. Most types consist of a finely comminuted meat emulsion, with or without added meat and fat pieces. The emulsification of such sausages is outlined under the headings: pre-salting; tumbling with salt and phosphate; high concentration salting; extraneous phosphate; citrates, lactates, lactones; protein emulsifiers; non-protein emulsifiers; max. mincing and emulsifying; and vacuum chopping. Processing (filling into casings, smoking/cooking), packaging and legislation are also briefly discussed. JA

2

Inhibition of morpholine nitrosation by some phenolic wood smoke components.
Issenberg, P.; Virk, M.
Abstracts of Papers, American Chemical Society **168** AGFD 53 (1974) [En] [Eppley Inst. for Res. in Cancer, Univ. of Nebraska, Med. Center, Omaha, Nebraska 68105, USA]

Human exposure to carcinogenic N-nitroso compounds is influenced by amounts of precursor amines and nitrosating agents present in foods and other parts of the environment and by catalysts and inhibitors which may occur naturally or be added. Any factor which influences reaction rates will modify yields of N-nitroso compounds produced in foods or by intragastric reaction. Some phenolic compounds, previously identified in hardwood sawdust smoke and smoked foods, may be nitrosated and compete with amines for available nitrite. Phenol structure is an important factor in determining rate constants for C-nitrosation reactions. Ability of some phenolic components of smoked foods to inhibit nitrosation of morpholine was investigated. Model reaction mixture (pH 3.0) contained 0.01M morpholine, 0.02M sodium nitrite, and 0.02M phenol: 0.02M ascorbic acid was employed as reference inhibitor. Reaction time was 90 min. Under these conditions, nitrosomorpholine yield was 30% in uninhibited mixture. Phenol, 2-methoxyphenol, 2-methoxy-4-methylphenol, 2,6-dimethoxyphenol, and ascorbic acid provided 15%, 71%, 81%, 93%, and 96% inhibition, respectively. Since many nitrite cured foods are smoked, influence of smoke components on nitroso compound formation must be thoroughly evaluated. AS

3

[Cold-smoking of frozen fish.]
Mel'nikova, O. M.; Khitrina, V. A.
Rybnoe Khozyaistvo No. 12, 64-65 (1973) [Ru] [TINRO, USSR]

The results of mixed salting, soaking and cold-smoking of various species of frozen-stored fish are described. After 3 days, the fish reaches an intermediate stage of salting, i.e. the salt content averages 10% and the wt. loss is 7-9%. A short period for redistribution of salt in the fish tissues is insufficient for development of optimal organoleptic properties; the fish must, therefore, be stored after cold smoking. Fish containing >5% fat were classified 'very good'. Specific characteristics of various types of fish should be considered before cold smoking. STI

4

[Water consumption in the production of smoked and canned fish products and means of reducing it.]
Gubanova, A. G.; Noskova, V. I.
Trudy Vsesoyuznogo Nauchno-issledovatel'skogo Instituta Morskogo Rybnogo Khozyaistva i Okeanografii **104**, 97-101 (1974) [Ru, en] [Vses. Nauchno-issled. Inst. Morskogo Rybnogo Khozyaistva i Okeanografii, Moscow, USSR]

Consumption of fresh water in the Azcherryba fish factories in the USSR during 1971-1972 was determined at different stages of smoking of different sea-fish and of canning fish in oil or tomato sauce as such or with vegetables. Characteristics of initial and spent water from some of the operations are tabulated. It is considered that the use of water was excessive and measures leading to saving approx. 35% in canning operations and 30-65% in smoking operations are outlined. SKK

5

[Bacteriostatic properties of smoke preparations. I. Comparative studies on five preparations.]
Houben, J. H.
Voedingsmiddelentechnologie **7** (41) 8-11 (1974) [29 ref. Nl] [Afdeling Tech., Rijksuniv., Biltstraat 172, Utrecht, Netherlands]

Inhibition of various bacteria of significance in the meat industry (Bacillus cereus, B. subtilis, Escherichia coli. Microbacterium sp., Micrococcus sp., Staphylococcus aureus, Streptococcus faecalis and Lactobacillus sp.) by the commercial smoke preparations (i) Ban Aroma, (ii) Charsol EZC 85, (iii) Dragoco 9/012496, (iv) Fumapur and (v) Naarden 1M 142 was studied. Growth of the bacteria at 8, 18, 30 or 37°C on TOYM agar plates containing the smoke preparations in concn. approx. equal to those used in meat products was compared to growth on control plates not containing smoke preparations. Tables of results are given. (v) was strongly bacteriostatic; (ii) and

(iv) showed moderate bacteriostatic activity and (i) and (iii) showed very little activity. The strains of bacterial tested differed markedly in sensitivity to smoke preparations, Bacillus spp. and Microbacterium sp. being the most sensitive, and E. coli and Lactobacillaceae being the most resistant. AJDW

6

Dry versus liquid smoke curing turkeys.
Cooper, J. B.; Jenkinson, M.
Poultry Science 53 (4) 1355-1358 (1974) [7 ref. En] [Poultry Sci. Dept., Clemson Univ., S. Carolina, 29631, USA]

Large type Broad Breasted White turkey hens were used in a comparison of liquid smoke and dry smoke curing. Liquid smoke curing resulted in an increase in finished raw carcass wt. compared to the fresh carcass wt. Dry smoked carcasses weight less than the fresh carcass. There was no difference in % cooking loss between treatments. A taste panel found no significant differences in smoke flavour concn. in either white or dark meat nor a preference of treatment. AS

7

Smoked pheasant: levels of curing brine and frozen storage intervals.
Deethardt, D.; Hettler, F. M.
Poultry Science 52 (6) 2324-2327 (1973) [2 ref. En] [S. Dakota Agric. Expt. Sta., Dept. of Home Economics, S. Dakota St. Univ., Brookings, S. Dakota 57006, USA]

Twelve hen pheasants were cured in one of two curing brines (10% curing brine with 8% cover brine, and 24% brine with 20% cover brine) and smoked for 9 hours at 66°C. Cooked sampling was done at 0, 3, 6 and 9 months frozen storage. The breast and thigh from the left side were used for taste panel evaluations of appearance, tenderness, juiciness and flavour. Right portions were used for objective tenderness and extractable fluids. A second lot of birds of 10 each for two intermediary curing brines of 20% and 15% with cover brines of 15% and 12% respectively were similarly evaluated. Smoked pheasant after 9 months frozen storage was still acceptable. Curing brine of 20% with 15% cover brine was most acceptable to the taste panel. AS

8

[Determination of nitrosamines in foods. I.]
Kann, Yu. M. [Kann, J.]; Kask, K. A.; Tauts, O. V.; Raya, K. K. [Raja, K.]
Tallinna Polütehnilise Instituudi Toimetised, A No. 331, 109-116 (1973) [33 ref. Ru, en]

It is considered on the basis of literature data and tests carried out by the authors on smoked fish that GLC with flame-ionization detector is the method of choice for nitrosamine determination in foods. SKK

9

Smoked fish product.
Unilever Ltd.
British Patent 1 360 609 (1974) [En]

Pieces of raw fish are brought into contact with salt, and moulded into serving size portions which are frozen and subjected to wood smoke. IFT

10

[An analysis of hot smoking of fish in tunnel-type smokehouses.]
Nikitin, B. N.
Rybnoe Khozyaistvo No. 11, 63-65 (1973) [Ru] [Leningradskii Tekhnologicheskii Inst. Kholodil'noi Promyshlennosti, USSR]

The properties of smoked products are considerably affected by the drying techniques, which produce a significant effect on the whole hot smoking process. The basic smoking parameters are the drying temp., moisture content and the air/smoke mixture flow rate, as well as the composition and concn. of smoke. Tunnel smoking is done under non-uniform conditions, the air/smoke mixture parameters varying over the tunnel length. Curves constructed showing the distribution of temp. over the tunnel length and at different points in the product-carrying cars. The temp. curve analysis does not provide a complete picture of the smoking process; however, on the basis of the temp. differences as at different points of car height the drying intensity can be assessed; horizontal differences show the degree of non-uniformity in the distribution of the smoking agent. STI

11

[The thermal regime of smoke formation in smoke generators.]
Sadovskii, B. F.; Khvan, E. A.; Radakova, T. N.; Bazarov, A. P.
Rybnoe Khozyaistvo No. 3, 80-82 (1974) [Ru]

Temperature conditions in (i) the Quarner-Brook and (ii) the Kirov kolkhoz smoke generators were studied. The average smoke temp. in (i) and (ii) were 90-100°C and 60°C respectively. A major disadvantage of enclosed-type smoke generators such as (ii) is the danger of explosion; other disadvantages of (ii) include condensation of some of the smoke constituents, and poorer quality of the smoked products. STI

12

[Catalytic additional combustion of residual smoke gases from fish smoking.]
Abaseev, V. K.; Kvasov, A. A.; Shaposhnikov, Yu. K.
Rybnoe Khozyaistvo No. 11, 66-67 (1973) [2 ref. Ru] [Dzerzhinskii Filial NIIOGAZ, USSR]

Catalysts and operating conditions for 100% neutralization of toxic substances (especially the

carcinogen 3,4-benzypyrene) in residual gases from the smoking of fish were studied; the best results were achieved with the M-2 catalyst, consisting of a chrome-nickel spiral with an active Pt layer. Catalyst activity was not impaired after ⩾300 h continuous operation. The dispersion, composition and entrainment of the smoke were studied, together with conditions preventing formation of nitrogen oxides during regeneration. Optimum temp. and air flow rate conditions for hot and cold smoking of fish are discussed. STI

13

[A quick process of production of smoke-baked products from beef.]
Akopova, R.
Myasnaya Industriya SSSR No. 11, 29-30 (1973) [Ru] [TSKB Ministerstva Myasnoi i Molochnoi Promyshlennosti Armyanskoi SSR, USSR]

A rapid method for manufacture of cured meat products is described, in which injection of the pickle into the muscle and washing of the meat after salting are eliminated. The process is accelerated by a factor of 1.7-2.8. The cured product is smoked for 2-2.5 h at 85°C, the for ⩽2.5 h at 75°C. The process gives high quality smoke-baked products of juicy consistency without the use of proteolytic enzymes. STI

14

[Smoked fillets of poultry.]
Auda, R. S.
French Patent Application 2 206 054 (1974) [Fr]

Fresh poultry fillets are steeped for 12 min in brine which has been prepared 24 h in advance from 2 l. water to 1 kg salt, plus thyme, bay leaves, onions, garlic, etc. The fillets are hung up to dry in a cold room at 2-4°C for 4 h, smoked by burning ground chestnuts for 4 h, returned (while still suspended on hooks) to the cold room at 2-4°C for 1½ h, and vacuum packed in polyethylene film. Shelf life is 2-6 months. W&Co

15

[Smoking today.] Räuchern heute.
Kersken, H.
Fleischwirtschaft 54 (11) 1721-1722, 1724, 1726 (1974) [13 ref. De] [Kreisveterinäramt, 4130 Moers, Lessingstrasse 25, Federal Republic of Germany]

Effects of smoking on meat colour, flavour and preservation and on formation of carcinogens is reviewed, and modern methods designed to reduce 3,4-benzpyrene concn. are briefly outlined, including the steam smoking, fluidization, friction methods, electrostatic smoking processes, use of smoke concentrates and automatic smoke production with controlled air and smoke material supply fired by electrically-heated sawdust. Technical requirements of modern smoking plants are outlined. RM

16

[Changes induced by atmospheric oxygen in the amount of compounds reacting with phenolic compounds (4-aminoantipyrine), present in aqueous fractions of wood smoke condensates.]
Daniluk, B.; Michalowski, T.; Miler, K.; Wietrak, M.
Roczniki Instytutu Przemyslu Miesnego 10, 117-129 (1973) [10 ref. Pl, ru, en]

17

[Technical data of RZ-FAT-12.]
Generalov, N.
Myasnaya Industriya SSSR No. 3, 21-22 (1974) [Ru] [Vsesoyuznyi Nauchno-issled. Inst. Myasnoi Promyshlennosti, USSR]

Details are given of the RZ-FAT-12 3-chamber smoking unit for meat products (hourly capacity 1800 kg frankfurters or 1350 kg salami (80 mm diam), including values for the temp. and RH at various stages of the process (drying, cooking and smoking). STI

18

[Evaluation of the VNIIMP smoking preparation from the food hygiene point of view.]
Gogol', A.; Budagyan, F.
Myasnaya Industriya SSSR No. 4, 36-38 (1974) [Ru] [Tsentral'nyi Ordena Lenina Inst. Usovershvenstvovaniya Vrachei, USSR]

Details are given of studies on the VNIIMP smoke preparation (prepared by combustion of wood at 270-320°C, with subsequent purification by distillation and adsorption). The product is an aqueous solution containing 1.0-1.5% acids, 0.06-0.10% phenols, 0.035% methanol, 6.0-10.6 mmol carbonyl compounds/100 ml, 0.10% esters, 0.060% furfural and 0.020% acetone. pH is 2.8-3.0. No 3,4-benzpyrene was detected in the preparation. The product is used (at a concn. ⩽1.0%) in meat products; samples of salami made with the VNIIMP smoke preparation were of excellent quality. STI

19

[Installation for heat treatment of sausages.]
Okhotov, A. A.; Babanov, G. K.; Galushchenko, V. A.; Rubanik, V. V.; Tkach, N. V.; Kulik, V. V.
Trudy, Ukrainskii Nauchno-Issledovatel'skii Institut Myasnoi i Molochnoi Promyshlennosti No. 2, I, 33-39 (1972) [4 ref. Ru] [Ukrainskii Nauchno-issled. Inst. Myasnoi i Molochnoi Promyshlennosti, USSR]

An automated single or multiple chamber-type installation for smoking and heat treatment of sausages designed at the Ukrainian Meat and Milk Industry Research Institute, covered by USSR Patent 239021 [1966, Bartanov et al.] and in commercial use since 1964 (80 units in operation in

1971) is described and diagrammatically illustrated. The installation may be linked to any smoke generator and incorporates devices for reheating and recirculation of the smoke/air mixture. Capacity for different types of sausages is 2.9-4 t/7 h and the duration of a treatment cycle is 60-120 min. Data on wt. loss, yield, and moisture content of different sausages treated in the installation and on treatment regimes are tabulated. SKK

20

Effects of processing on the amino content of pork bellies.
Spinelli, A. M.; Lakritz, L.; Wasserman, A. E.
Journal of Agricultural and Food Chemistry **22** (6) 1026-1029 (1974) [14 ref. En] [Agric. Res. Service, USDA, E. Reg. Res. Center, Philadelphia, Pennsylvania 19118, USA]

The concn. of a number of amines was determined in fresh and processed pork bellies. Analyses were conducted for spermine, spermidine, putrescine, cadaverine, histamine, tyramine, tryptamine, and ethanolamine. Fresh, pickled and fully cured and smoked bellies were obtained from 2 commercial sources. The amines were recovered from perchloric acid extracts of the lean meat and derivatized with dansyl chloride. The fluorescent derivatives were separated by TLC, extracted, and then quantitated spectrofluorometrically. Concn./100 g tissue ranged from 0.03 mg for cadaverine to 8.1 mg for spermine. There were considerable variations in the levels of the individual amines within different specimens of the same sample. Processing did not significantly alter the levels of the free amines. AS

21

Some facets of the smoke flavoring process.
[Conference proceedings]
Hollenbeck, C. M.; Moore, D. G.; Wendorff, W. L.
Proceedings of the Meat Industry Research Conference pp. 119-130 (1973) [11 ref. En] [Red Arrow Products Co., Manitowoc, Wisconsin 54220, USA]

Brief details are given of model studies on the use of liquid smoke preparations in the manufacture of wieners. Aspects studied included: factors influencing penetration of smoke constituents through the casing (contact time, smoke concn., smoke solution temp., interruption of contact time); effects of the pH of the smoke solution on brown colour formation; and the reactivity of 16 carbonyl compounds in brown colour formation. Results showed that smoke penetration increased with increasing contact time, temp. and smoke concn. Interrupted contact increased uptake of smoke constituents. Brown colour formation was minimal at pH 4.0; it is suggested that the colour formation at pH <4.0 may not be due to an amino-carbonyl reaction. Carbonyl compounds differed markedly in brown colour formation; keto or unsaturated aldehydes were more active as colour formers than aliphatic aldehydes, sugars or ketones. AJDW

22

[Air flow in a smoking and drying chamber.]
Tkachenko, V. V.
Rybnoe Khozyaistvo No. 10, 64-67 (1974) [1 ref. Ru] [VNIRO, USSR]

Details are given of studies (using He as an indicator gas) on air flow and retention time in smoking/drying chambers; investigations were conducted on the effect of air flow conditions on drying and smoking of cod liver. The indicator gas method gave good results. STI

23

[Food smoking process.]
Iwatare, S.
Japanese Patent 5 000 902 (1975) [Ja]

Smoked foods are prepared by soaking in a carcinogen-free smoking liquid containing spices, followed by coating with pigmented oil. IFT

24

Liquid smoke regenerator.
Gilliland, R. D.; Wistreich, H. E. (B. Haller & Co.)
United States Patent 3 861 292 (1975) [En]

Smokehouse apparatus for recirculating gaseous vapours is described. IFT

25

Effect of smokehouse temperature, humidity and air flow on smoke penetration into fish muscle.
Chan, W. S.; Toledo, R. T.; Deng, J.
Journal of Food Science **40** (2) 240-243 (1975) [10 ref. En] [Food Sci. Dept., Univ. of Georgia, Athens, Georgia 30602, USA]

Smoke flavour has been related directly to concn. of absorbed phenolic compounds. When filleted fish were smoked under controlled temp. and RH <80%, rate of absorption of phenolics generally was very rapid initially followed by gradual decrease until saturation concn. was reached. Saturation concn. and smoking time necessary to achieve this level was a function of smoke temp., RH and air flow. At air flows equivalent to 10 air changes in the smokehouse/min, temp. of 100-200°F, and RH of 22%, saturation was achieved within 3 h of smoking. At 60% RH, saturation concn. of phenolics in flesh increased with increasing temp. ≤160°F and decreased with increasing temp. >160°F. At 80% RH, absorption rate was generally slower and saturation concn. were not achieved within the time interval where saturation was attained at lower RH. Smoke penetration was very slow in still air. Phenolics were absorbed primarily on the first 0.125 in layer from the surface. Temp. change within the fillet was a broken heating curve when

plotted on semi-logarithmic coordinates against smoking time. Temp. increase slowed down when fillet temp. equalled wet bulb temp. Smoking for 20 min at 160°F dry bulb and 140°F wet bulb (60% RH) followed by 40 min at 200°F dry bulb and 190°F wet bulb (80% RH) allowed sufficient heat treatment for 12D inactivation of Clostridium botulinum type E and allowed sufficient smoke absorption for flavour.

IFT

26

Fish farms and botulism.
Anon.
British Medical Journal 2 (5963) 106 (1975) [3 ref. En]

Problems of contamination of fish and fish products with Clostridium botulinum are discussed, with reference to detection of C. botulinum in fish products in the N. Pacific region, herrings caught in Norwegian waters, fish farms in the UK and the Federal Republic of Germany, and vacuum-packaged smoked trout in the Federal Republic of Germany. Effects of smoke constituents on the germination of C. botulinum spores in salmon tissue are also discussed. AJDW

27

[The lactic acid forming microflora of dry sausage and the technologically determined changes in undergoes.] Die Milchsäure bildende Rohwurst-Mikroflora und ihre technologisch bedingte Veränderung.
Urbaniak, L.; Pezacki, W.
Fleischwirtschaft 55 (2) 229-232, 235-237 (1975) [39 ref. De, en, fr] [Inst. für Tech. der Lebensmittel Tierischer Herkunft, Landwirtschaftlichen Akad., Mazowiecka 48, 60-623 Poznan, Poland]

The physiological characteristics of dry sausage-fermenting bacteria, their changes during sausage manufacture, and glucose fermentation by isolated strains were studied. Cervelat sausages were produced with 0.2% added sucrose, glucose, maltose or potato flour, and were either smoked or treated with smoke concentrate. Sausages were examined after drying, smoking and 10, 20 and 40 days storage. The number of lactic acid-forming bacteria varied with changes in the medium, processing time and type of added carbohydrate. Carbohydrate decomposition was affected by its mol. wt., Eh, incubation temp. and the composition of the microflora. The lactic acid-forming bacteria are initially chiefly homofermentative strains, but as a result of changes in the medium adaptive enzymes are induced and heterofermentative strains become predominant. The activation of adaptive enzymes explains the constantly changing equilibrium of fermentation, and complete oxidation of added carbohydrates. During manufacture and storage of dry sausages the most growth occurred among typically heterofermentative strains. [Continued in following abstr.] RM

28

Survival of Salmonella dublin and Salmonella typhimurium in Lebanon bologna.
Smith, J. L.; Palumbo, S. A.; Kissinger, J. C.; Huhtanen, C. N.
Journal of Milk and Food Technology 38 (3) 150-154 (1975) [18 ref. En] [E. Regional Res. Center, Philadelphia, Pennsylvania 19118, USA]

Survival and destruction of Salm. dublin and Salm. typhimurium added to Lebanon bologna were studied during manufacture of this sausage. During ageing of salted cubed beef at 5°C, viable cell counts of Salm. dublin did not change over a 10-day period. Cell counts of Salm. dublin were reduced 3-4 log cycles during 4-day fermentation at 35°C; further reduction in viable Salmonella count occurred during mellowing of bolognas at 5°C. The number of Salm. typhimurium was usually reduced to an undetectable level before the end of fermentation. Salm. typhimurium was consistently more sensitive to the acid conditions of Lebanon bologna than was Salm. dublin. Introduction of an optional cooking step indicated that heating of bolognas to 51.7°C or above led to destruction of salmonellae. Unaged beef which was not inoculated with starter culture did not ferment and there was very little reduction in numbers of added salmonellae. Salmonellae were destroyed more rapidly in Lebanon bologna made from unaged beef with starter culture than in bologna made from aged beef (natural flora fermentation). Smoking also appeared to contribute to destruction of salmonellae. 4 commercial Lebanon bolognas were tested for the presence of salmonellae but none were detected. AS

29

[Manufacturing process for a smoked aroma for foods.] Verfahren zur Herstellung eines Räucheraromas für Lebensmittel.
Henning, W.
German Federal Republic Patent Application
2 325 900 (1974) [De]

A smoked aroma preparation for foods, e.g. meats, is produced by smoking of food additives, then extracting soluble smoke constituents with water, vinegar or other aqueous solutions. The extract is then adsorbed onto a powdered food (sugar, salt, cornflour, coconut shell flour, etc.) to form a stable dry smoking preparation. The 3,4-benzpyrene concn. is considerably lower than the legal limit of 1 µg. W&Co

30

[Modern disinfestation methods.]
Schädlingsbekämpfung aus moderner Sicht.
Benzing, L.
Mühle + Mischfuttertechnik **112** (20) 267-268 (1975) [De] [Biol. Lab., Chem. Fabrik Dr. W. Freyberg, Laudenbach, Federal Republic of Germany]

The following disinfestation compounds are briefly discussed: fumigants, fogging and smoking agents, spraying and dusting compounds, and baits (especially effective for rodents). RM

31

[New method for smoking of meat and meat products.] Neue Räuchermethoden für Fleisch und Fleischerzeugnisse.
Rusz, J.; Kopslova, M.
Fleisch **28** (12) 236-238 (1974) [14 ref. De] [Forschungsinst. der Fleischind., Brno, Czechoslovakia]

Aspects considered in this discussion of new smoking methods include: the composition and technological properties of smoke; use of smoke preparations in meat processing; electrostatic filtration of smoke to remove carcinogenic hydrocarbons; and the 'Germos' smoke generation system (based on treatment of sawdust with superheated steam). IN

32

[Possibilities of aromatizing semi-perishable canned products.]
Polic, M.; Trumic, Z.; Modic, P.
Tehnologija Mesa **15** (7/8) 222-224 (1974) [4 ref. Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

Canned pasteurized hams are at present manufactured without smoking. This results in insufficient autolytic and biochemical changes in the meat. Studies on the use of spices and the Japanese smoke preparation 'Ban-Aroma S' to improve the flavour of canned hams are described; addition of garlic + celery gave the best results. STI

33

Phenols in smoked cured meats. Phenolic composition of commercial liquid smoke preparations and derived bacon.
Knowles, M. E.; Gilbert, J.; McWeeny, D. J.
Journal of the Science of Food and Agriculture **26** (2) 189-196 (1975) [11 ref. En] [Min. of Agric., Fisheries and Food, Food Sci. Div., Colney Lane, Norwich NR4 7UA, UK]

The phenolic composition of 2 commercial liquid smoke emulsions has been determined by gas chromatography-MS of the free phenols and their trimethylsilyl ethers. The phenolic fraction of smoked bacons derived from the liquid smoke emulsions has been determined similarly and compared with the phenolic fraction of traditional kiln-smoked bacon. A preliminary examination of phenol penetration is smoked bacon has been made on a sample prepared from a liquid smoke emulsion by electrostatic spraying. AS

34

Liquid smoke preparation.
Wistreich, H. E.; Juhn, H. (B. Heller & Co.)
United States Patent 3 875 314 (1975) [En]

Wood particles are tested with acetic acid prior to conversion to smoke in the preparation of liquid smoke. IFT

35

Liquid smoke production.
Melcer, I.; Sair, L. (Griffith Laboratories Inc.)
United States Patent 3 873 741 (1975) [En]

In a process for the production of liquid smoke, the concn. of air in a wood heating chamber is carefully controlled to produce a high yield of liquid smoke product free from carcinogenic compounds. IFT

36

Smoke generator.
Haug, T. J.
United States Patent 3 871 353 (1975) [En]

Apparatus for converting liquid smoke to gaseous smoke by contact with a heated rotating drum having a metallic surface is described. IFT

37

The chemistry of smoked foods: a review. [Review]
Gilbert, J.; Knowles, M. E.
Journal of Food Technology **10** (3) 245-261 (1975) [71 ref. En] [Min. of Agric., Fisheries & Food, Food Sci. Div., Colney Lane, Norwich NR4 7UA, UK]

This review outlines the recent advances in the chemistry of the 'smoke' fraction of smoked foods, surveys the constituents reported in wood smoke, briefly considers their formation during wood combustion, and assesses their significance as far as known in terms of flavour, colour, preservative effect and food safety. Polycyclic aromatic hydrocarbons in smoked foods (mainly meats and meat products) and 'smoke flavours' are discussed. AL

38

Liquid smoke treatment.
Trainor, J. E.; Haug, T. J. (F. C. Heiden Inc.)
United States Patent 3 877 361 (1975) [En]

The invention describes a liquid smoke spray cabinet adapted to impart a jarring action to meat during treatment, to enhance removal of excess liquid; a blower is employed to selectively apply a flow of pressurized air over the outer surface of the meat being treated. IFT

39

The reduction of added sodium nitrate and nitrite in poultry meat curing.
Sharma, N.
Indian Poultry Gazette **58** (2) 102-106 (1974)
[11 ref. En] [Div. of Poultry Res., Indian Vet. Res. Inst., Izatnagar, Uttar Pradesh, India]

25 birds aged 6-9 months were used to study the amount of nitrite present in the tissues of untreated, cured, and cured smoked chickens after 0, 4 and 8 days storage at (i) room temp. (25-26°C) or (ii) refrigeration temp. (5-6°C). The curing solution contained 5.44 kg NaCl, 2.72 kg cane sugar, 85 g sodium nitrate, 112 g sodium nitrite and 20 g monosoidum glutamate, all dissolved in 40 l. mineral-free water. There was no nitrite in fresh chilled chicken; after 72 h of curing treatment at 5°C the nitrite content was 281 ppm. Nitrite concn. in stored samples were, for (i) and (ii) respectively: 347 and 395 ppm after 4 days storage; not given (spoiled on 5th day) and 256 ppm at 8 days; and not given and 114 ppm after pressure cooking on the 8th day. After smoking at 40°C for 4 h in hardwood smoke the corresponding amounts were: 225 ppm at 0 days; 240 and 281 ppm at 4 days; 152 and 188 ppm at 8 days; and 23 and 27 ppm after cooking. The dark meat had a higher nitrite content than white meat.   AL

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FAB 18

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H. BROOKES
ASSISTANT EDITOR

1

N-Nitrosodimethylamine in cold-smoked sablefish.
Gadbois, D. F.; Ravesi, E. M.; Lundstrom, R. C.; Maney, R. S.
Journal of Agricultural and Food Chemistry **23** (4) 665-668 (1975) [8 ref. En] [US Dept. of Commerce, Nat. Oceanic and Atmospheric Administration, Nat. Marine Fisheries Service, Northeast Util. Res. Center, Gloucester, Massachusetts 01930, USA]

Sablefish was treated with nitrite levels ranging from 0 to 1300 ppm prior to being cold smoked. The flesh was analysed for the presence of N-nitroso compounds by GLC immediately after processing and again after 2 wk storage at 40°F. Trace amounts of N-nitrosodimethylamine (<10 parts/billion) were detected in samples with nitrite levels ranging from 0 to 550 ppm. This value did not increase with higher nitrite levels. Storage at 40°F did reflect a slight decrease in concn. The identity of the isolated compound was confirmed by GLC as the nitramine derivative and by GLC-MS. AS

2

Collagen casings.
Miller, A. T. (Devro Inc.)
United States Patent 3 894 158 (1975) [En]

Liquid smoke is added to a mass of acid-swollen collagen prior to extrusion to form a casing. IFT

3

[Study of smoking medium particles by electron microscopy.]
Rusanov, V. V.; Lapshin, I. I.; Kuchumov, A. M.
Rybnoe Khozyaistvo No. 5, 67-69 (1975) [Ru] [MINKh im. G. V. Plekhanova, USSR]

Electron microscopic studies on smoke particles are described. 90% of particles were of diam. ≤0.2 µm; of these, 63% were of diam. 0.03-0.1 µm. An equation for calculation of the size distribution of smoke particles is described. STI

4

Process for smoking food products.
Kureha Kagaku Kogyo Co. Ltd.
British Patent 1 397 472 (1975) [En]

Food materials to be smoked are wrapped in a heat shrinkable plastics film which has been rendered porous by subjecting it to IR radiation. A sheet capable of being swollen with moisture, and thereby rendered capable of gas transmission, is interposed between the plastics film and the product. Applications include hams, sausages and the like. HBr

5

[Experience with the PSM-2 smoke generator.]
Bunin, D. Kh.; Popov, M. V.
Rybnoe Khozyaistvo No. 3, 62-64 (1975) [Ru] [VNIRO, USSR]

Advantages of the PSM-2 smoke generator over previous types are discussed, with reference to changes in the heating system, the sawdust feed unit and the sawdust storage bin. The generated smoke is of high quality, and imparts excellent colour, flavour and aroma to fish products. Operation of the smoke generator must be carefully controlled, as clogging easily occurs. The quality of smoke generated is influenced by the characteristics of the sawdust used; this should be oak or beech, and particle size should be 2 mm × 2 mm × 2 mm to 3 mm × 3 mm × 3 mm. The sawdust should be free from dust or other contaminants. STI

6

[Changes in chemical composition of sprats during hot smoking using various equipment.]
Voskresenskii, N. A.; Alsuf'ev, V. A.; Radakova, T. N.; Makarov, O. E.
Rybnoe Khozyaistvo No. 2, 72-74 (1975) [Ru] [VNIRO, USSR]

The effects of 2 hot-smoking systems ((i) smoking at 70-95°C for 95 min; (ii) smoking for 60 min in an electrical smoking device, with IR irradiation) on the composition of sprats were studied. Tables of values are given for concn. of water, fat, ash and N compounds in the sprats smoked by (i) and (ii), and in individual parts of the fish (meat, head, skin, fins). Wt. losses during smoking were 26.5% for (i) and 15.8% for (ii). The major part of the wt. loss was water; losses of fat and protein were dependent on their concn. in the raw material and the smoking method used. IR irradiation reduced losses of N compounds. With method (i), wt. losses were mainly due to loss of water from the head and meat; with method (ii), losses relating to other parts of the fish were greater. STI

7

[Study of the chemical composition of smoke evolved by different types of wood.]
Khvan, E. A.; Shaposhnikov, Yu. K.; Radakova, T. N.; Alsuf'ev, V. A.; Kondakova, L. V.
Rybnoe Khozyaistvo No. 5, 62-63 (1975) [Ru]

Smoke produced from (i) oak wood and (ii) pine wood was analysed. Tables of results are given. The results show that, under equivalent pyrolysis conditions, the composition of the smoke is dependent on the wood type used. Smoke from (i) contained more volatile acids and neutral and basic substances than that from (ii). The higher proportion of resin in (ii) results in higher concn. of phenols and 3,4-benzpyrene in the smoke. For manufacture of high quality smoked products with a low 3,4-benzpyrene concn., smoke from wood from deciduous trees is recommended. STI

8

[The bacteriostatic properties of smoke preparations. II. Inhibitory activity in meat suspensions.]
Houben, J. H.
Voedingsmiddelentechnologie **8** (15) 5-7 (1975) [3 ref. Nl] [Vakgroep Voedingsmiddelen van Dierlijke Oorsprong, Afdeling Tech., Rijksuniv., Utrecht, Netherlands]

The effects of 2 liquid smoke preparations (i) Charsol EZC 85 and (ii) Naarden IM 142 on growth of bacteria (Bacillus cereus 89 II, B. subtilis A, Escherichia coli ATCC 11229, Lactobacillus spp. 319, Microbacterium spp. C_2, Micrococcus spp. ic, Staphylococcus aureus ATCC 6538, Streptococcus faecium E_{15} and Str. faecium E_{20}) in pork suspension at pH 6.3 were studied. Each smoke preparation was tested at concn. of 0, 0.25, 0.50, 1.00 and 2.00%; a mixture of additives commonly used in meat processing (NaCl, $NaNO_2$, phosphates, glucose, sodium glutamate, ascorbic acid) was added to some samples of pork suspension. The inoculated samples were then incubated for 14 days at 18°C, and bacterial growth was evaluated. A diagram of results is given. No inhibitory activity of (i) or (ii) in the absence of the mixture of additives was observed. In the presence of the mixture of additives, Staph. aureus was inhibited by 2.00% (i). Lactobacillus spp. 319 was inhibited by 1.00% (ii), and both Bacillus spp. were inhibited by 0.25% (ii). It is concluded that these smoke preparations are unlikely to have any significant effect on the bacteriological stability of meat products. [See FSTA (1975) 7 2S167 for part I.] AJDW

9

[Air conditioning in drying of sausages.]
Levin, A. M.; Rodin, A. K.; Slepykh, G. M.; Ivanov, V. A.
Kholodil'naya Tekhnika No. 4, 46-47 (1975) [3 ref. Ru] [Saratovskii Politekh. Inst., USSR]

Air conditions (temp. and RH) in chambers for drying of salami-type sausages were studied; forced ventilation in driers is illustrated by an example. An air conditioning project for pit-type smoking installations was developed on the basis of experimental data. Periodical fluctuations in the direction of air flow produce a homogenous atm, improving the drying and smoking performance of the installation. STI

10

The effect of smoking and drying on the lipids of West African herring (Sardinella spp.).
Woolfe, M. L.
Journal of Food Technology **10** (5) 515-522 (1975) [16 ref. En] [Dep. of Nutr. & Food Sci., Univ. of Ghana, PO Box 134, Legon, Ghana]

The fate of the lipids of smoke dried Sardinella aurita has been investigated. Peroxide values showed that smoke drying initiated lipid oxidation. Crude fractionation of the lipids showed that the site of initiation was bound lipids in contact with the proteins. Comparison of the O_2 uptake of smoke dried fish under different time-temp. conditions indicated that final moisture content was the predominant factor affecting rate of oxidation. The use of smoke did not appear to affect the rate of oxidation. AS

11

[Tips for selection of modern smoking equipment.] Tips zur Auswahl von zeitgemässen Rauchanlagen.
Eisner, M.
Fleischerei **26** (1) 46, 48-49 (1975) [De]

12

[Boiling, smoking and ripening in small-scale meat-processing plants.] Koche- Räuchern- Reifen im Handwerksbetrieb.
Reich, H.
Fleischerei **26** (1) 9-11 (1975) [De] [C. & E. Reich KG, Postfach 4, 7064 Remshalden-Hebsack, Federal Republic of Germany]

Methods and equipment for processing of sausages are discussed, including: vats and other systems for boiling of sausages; selection of heating systems; smoking chambers; smoke-generation systems (conventional systems, friction-type smoke generators, and superheated steam-type smoke generators); and combined boiling, smoking and ripening units. AJDW

13

Smoke processing.
Freeland, H. L.; Flanagan, J. C. (Koch Supplies Inc.)
United States Patent 3 903 788 (1975) [En]

Apparatus for smoke and heat processing of food products employs blower means and baffle means to ensure adequate contact of the treating fluid with the foods. IFT

14

[Analysis of a commercial smoke-curing agent. I. Separation and identification of high-boiling phenolic fractions.]
Radecki, A.; Bednarek, P.; Boltrukiewicz, J.; Cacha, R.; Rapicki, W.; Grzybowski, J.; Halkiewicz, J.; Lamparczyk, H.
Bromatologia i Chemia Toksykologiczna **8** (2) 179-184 (1975) [6 ref. Pl, ru, en] [Zaklad Chem. Fizycznej Akad. Med., Gdansk, Poland]

Preparative gas chromatography of a commercial (unnamed) smoke-curing agent revealed the presence of 3 compounds in the high-boiling phenolic fraction. Elementary analysis and IR, NMR and UV spectral analysis showed that the 3 compounds had structures similar to those of 2,6-dimethoxyphenol, 2,6-dimethoxy-4-methylphenol and 2,6-dimethoxy-4-ethylphenol. They were found to have strong antioxidative and antibacterial activities. AS

15

[Analysis of a commercial smoke-curing agent. II. Separation and identification of some constituents of the low-boiling phenolic fraction.]
Radecki, A.; Halkiewicz, J.; Lamparczyk, H.; Grzybowski, J.; Bednarek, P.; Boltrukiewicz, J.; Cacha, R.; Rapicki, W.
Bromatologia i Chemia Toksykologiczna **8** (2) 185-190 (1975) [6 ref. Pl, ru, en] [Zaklad Chem. Fizycznej Akad. Med., Gdansk, Poland]

Using the same techniques as for the high-boiling phenolic fraction (see preceding abstr.), 5 compounds were identified in the low-boiling phenolic fraction: guaiacol, phenol, 2-methoxy-4-methylphenol, m-cresol and p-cresol. AS

16

[Trends in smoking and cooking.] Räuchern und Kochen im Wandel der Zeit.
Reichart, E.
Fleischerei **26** (4) 47-48, V (1975) [De, en, fr] [Firma Wilhelm Fessmann, 7057 Winnenden-9, Postfach 360, Federal Republic of Germany]

17

[The effects of dry-curing and smoking on the palatability and preservation of pork.]
Kim, J. H.; Lee, J. M.; Lee, C. K.
Research Reports of the Office of Rural Development, Livestock **16**, 83-90 (1974) [25 ref. Ko, en] [Livestock Exp. Sta., Suweon, Korea]

A series of studies on the effects of salt concn. (4-10%), smoking conditions (no smoking, smoking at 35-40°C, or smoking at 50-55°C) and storage temp. (0-5° or 10-22°C) on the quality and storage life of rolled hams is described. Tables and graphs are given showing shrinkage, palatability, pH and volatile basic N concn. of hams stored for ≤90 days. Palatability increased with decreasing salt concn. Shrinkage increased with increasing storage time, but was not affected by salt concn. Smoking temp. had no significant effect on changes in the hams during storage. Volatile basic N and pH increased during storage; volatile basic N concn. decreased with increasing salt concn. Storage life increased with increasing salt concn. and decreasing storage temp. [From En summ.] AJDW

18

Evaluation of certain food additives. Some food colours, thickening agents, smoke condensates, and certain other substances. Nineteenth report of the Joint FAO/WHO Expert Committee on Food Additives.
World Health Organization; Food & Agriculture Organization
World Health Organization Technical Report Series No. 576, 23pp. ISBN 92-4-120576-8 (1975) [En] [Geneva, Switzerland]

Among general matters considered in the report are the detn. of impurities in food additives and investigation of their toxicity. The preservation and flavouring of food by smoking procedures is discussed. More detailed information is required on the raw materials, smoking process, composition of the smokes (including purified smoke condensates and liquid smoke) and the end products. A number of food colours, thickening agents and other miscellaneous food additives were evaluated for the first time and some substances re-evaluated. Annexes included are: reports and other documents resulting from previous meetings of this committee; acceptable daily intakes and information on specifications; and further toxicological studies and information required. Fr, Ru and Es editions of the report are in preparation. [This report is also issued as FAO Nutrition Meetings Report Series No. 55.] AL

19

An experimental fish drying and smoking plant on Volta Lake, Ghana: design, construction and economic considerations.
Watanabe, K.
Tropical Science **17** (2) 75-93 (1975) [16 ref. En, fr, es] [Inst. Oceanografico, Univ. de Sao Paulo, Cidade Univ., Butantan, Sao Paulo, Brazil]

A small-scale fish drying and smoking plant with a daily capacity of 100 kg of fresh fish was built at Akosombo, Ghana, for experimental purposes. It included a shed (7.5 × 4.5 m) with a store room (1.8 × 3.6 m), two 5.4 m long drying racks, one with a slanting top and the other with a flat top; and a smoker-dryer with a loading capacity of 100 kg of fresh fish for hot and warm smoking as well as for drying without smoking. The total construction cost, based on material prices and labour costs at the end of 1972, was estimated at about φ470 (US $409), and the cost for ancillary equipment and tools at about C130 (US $113). This experimental plant could handle about 100 kg of fish per day to produce salted, dried, and smoked fish at a running cost of C150 (US $130) per month including depreciation, labour, first aid, repairs, firewood and salt. The plant was estimated as economically profitable, even if operated commercially, at a village with only 4-8 fishing units. Under such conditions, assuming the purchase price of fresh fish from fishermen was C0.25/kg and the wholesale price at the plant to fish traders was C0.90/kg of the dried products of 40% yield, the plant would make a monthly profit before tax of C80 (US $62) provided 80 kg of fresh fish were supplied daily. AS

20

Apparatus for the continuous treatment of various products in particular of food products, by various treatment agents.
Garcelon, R.
British Patent 1 405 963 (1975) [En]

Articulated conveyor apparatus for the continuous smoking of fish fillets is described. IFT

21

[Process and apparatus for smoke treatment of foodstuffs.] Verfahren und Vorrichtung zur Räucherbehandlung von Lebensmitteln.
Mölck, H.
German Federal Republic Patent Application 2 364 462 (1975) [De]

A liquid smoke for application to a sausage casing is prepared from an aqueous solution containing aromatic components of burnt wood. The solution is heated under pressure to a temp. >vaporization temp. corresponding to the pressure in the treatment chamber where it is allowed to vaporize spontaneously. This ensures that treatment conditions are always constant and there is no possibility of overheating the aromatic components. W&Co

22

[Problems of smoking meat and meat products.] Probleme beim Räuchern von Fleisch und Fleischerzeugnissen.
Potthast, K.
Fleischwirtschaft 55 (11) 1492, 1494-1496 (1975) [25 ref. De] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

The effects of smoking technology on carcinogens in smoked meat products are reviewed on the basis of published data. The concn. of 3,4-benzpyrene, used as indicator of polycyclic aromatic hydrocarbons (PAH) (Federal German tolerance = 1 part/billion), is affected mainly by temp. of smoke generation. It can be controlled by producing smoke at <400°C, by removing smoke particles through filtration or a cold trap, by wrapping meat products in synthetic casings impermeable to PAH, by spatial separation of meat products from the source of smoke, or by reducing the smoking time for products with high surface:wt. ratios. The special problems of 'black-smoke cured' products are discussed and conventional slow smoking distinguished from short-time smoking; the resinous wood used produces a sooty smoke with high 3,4-benzpyrene concn. Production of smoke with superheated stem:air mixtures or by friction and use of smoke condensates are briefly discussed. RM

23

[Raw sausages and meat products. II. Raw meat products. Smoking and storage of uncooked cured meat.] Rohwurst und Rohfleischwaren. II. Rohfleischwaren (Fortsetzung). Räuchern und Aufbewahren von rohem Pökelfleisch.
Corretti, K.
Fleischwirtschaft 55 (11) 1504-1506, 1508-1510 (1975) [De] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

This series of articles on processing of uncooked meats is continued with a review of smoke-curing, including: materials and processes for smoke generation; effects of moisture, type of wood, combustion temp. and air supply on smoke generation and composition; and effects of smoke temp., flow rate and moisture content, RH, smoking procedure and time. Recommended storage conditions are: dark rooms at 10-15°C, RH 70-75%, ventilation at air speed 0.1-0.2 m/s, and delayed in film packing or protective dipping. [See also preceding abstr.] RM

24

[Curing smoke production with the friction smoke generator.] Erzeugung von Räucherrauch mit dem Friktionsrauchgenerator.
Klettner, P.-G.
Fleischwirtschaft 55 (11) 1498-1501 (1975) [9 ref. De] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

The operation and advantages of friction smoke generation are described. In Adam's method [Fleischwirtschaft (1960) **12** (2) 80-84] smoke is produced by intermittent pyrolysis of a wooden rod pressed onto a rotating steel cylinder, and temp. is controlled via the air supply, the pause between friction periods, or by water cooling. The temp. of smoke generation is evaluated by the temp. of the curing smoke, the wood, and the metal surface, and the wood decomposition temp. Due to the intermittent friction, curing smoke temp. is only about 10-15°C above ambient temp.; except for the actual friction area, wood temp. is ≤100°C, metal surface temp. 260-290°C and wood decomposition temp. during friction 450-560°C. 6 h curing trials on raw sausages in natural, cellophane, fibre and skin fibre casings, 55-90 mm diam. gave 3,4-benzpyrene concn. of <0.33 parts/billion in all cases. RM

25

Method of smoking brisling.
Bjelland & Co. AS
British Patent 1 407 728 (1975) [En]

Smoking process for fish, e.g. brisling or small herring, in which intense cooking is avoided by controlling the flow, of a hot air-smoke mixture at 110-120°C through the treatment chamber, is described. IFT

26

[Effect of smoking temperature on the calorific value or ordinary sausage.]
Kocot, M.; Szynkarczuk, J.
Medycyna Weterynaryjna 31 (4) 243-245 (1975) [12 ref. Pl, ru, en] [Inst. Higieny Produktow Zwierzecych, Wydzial Weterynaryjny, AR, Wroclaw, Poland]

Thermocouples were placed inside 8 sausages symmetrically distributed in each load of a smoking chamber (details of operation not given). The sausages, 350-400 mm long and with a 45-mm diam., were in natural casings. In 4 replications, the internal temp. of 32 sausages ranged from 54° to 90°C. Individual values for (i) moisture, (ii) fat and (iii) protein contents are graphically presented in relation to (iv) smoking temp.; and mean values

with SD are tabulated for these variables as well as calculated caloric contents. Rounded-off mean values for (i)-(iv) were 52, 28, and 15%, and 68°C. As would be expected, the calorific value increases with increase in smoking temp. It is pointed out that in the ordinary sausage examined, 78% of the caloric content stemmed from fat. SKK

27

[Behaviour of muscle lactate dehydrogenase and aldolase during ripening of 'speck'.]
Minoccheri, F.; Negrini, F.; Massari, M.
Industrie Alimentari **14** (11) 116-118 (1975) [7 ref. It]

24 'speck' type smoked hams were used in studied on changes in lactate dehydrogenase (LDH) and aldolase (ALD) activity during ripening. LDH and ALD activities were determined in extracts from the semimembranosus and semitendinosus muscles of hams ripened for 6, 30, 70 or 120 days. Tables and graphs of results are given. Both LDH and ALD activity decreased sharply up to approx. 30 days of ripening; the rate of decrease of enzyme activities then slowed. Decreases in ALD activity were more marked than decreases in LDH activity. The enzyme inactivation is attributed to thermal denaturation, and denaturation by aldehydes and polyphenols taken up during smoking. AJDW

28

[Smoking of salmon.]
Anon.
Revue de la Conserve Alimentation Moderne **No. 41,** 49-50 (1975) [Fr]

The manufacture of Deska smoked salmon is described briefly. The process, using oak or occasionally elm wood shavings and no added colourings, takes 3-5 days according to size. Vacuum packaging enables the smoked salmon (whole or sliced) to retain its high quality during storage. MEG

29

[Technological aspects of thermal processing of some semiperishable sausages, as depending on sausage casing type and equipment design.]
Dimitrijevic, D.; Perovic, M.; Ledencan, N.; Mercep, V.
Tehnologija Mesa **16** (3) 73-75 (1975) [14 ref. Sh, en] [Jugoslavenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

Effects of casing type (2 types of protein-based casings, and 1 type of cellophane casing) and smoking method on the quality of Krakow sausages were studied. Core temp. of 70°C were more rapidly achieved in sausages in protein casings than in those in cellophane casings. Wt. losses were higher in sausages processed in normal smokehouses than in those processed in Atmos equipment. Neither casing type nor smoking method significantly affected organoleptic properties. STI

30

Fermentation of native smoked sausage. [Thesis]
Sison, E. C.; Pederson, C. S.
Philippine Agriculturist **58** (1/2) 61-71 (1974) [17 ref. En] [Coll. of Agric., Univ. of the Philippines, Los Banos, Laguna 3720, Philippines]

Microbiological and pH changes during traditional processing of native fermented sausages were studied in 3 experimental series: 4 trials at various holding time-temp. combinations (1-3 days at 10-28°C) prior to smoking (2 days at 50-55°C), with or without inoculation with starter culture (Pediococcus cerevisiae); 1 day incubation at 41°C, 2 days smoking at 50-55°C, with or without inoculation with homofermenters (P. cerevisiae or Lactobacillus plantarum); or 16 h incubation at 41°C, 8 h smoking at 50-55°C, with or without inoculation with heterofermenters (L. mesenteroides or L. brevis). Results are shown graphically. It was observed that in non-inoculated samples the fermentation was initiated by aerobic and microaerophilic Streptococcus and Micrococcus spp. and completed by P. cerevisiae when pH had dropped from 6.0 to 5.0. The fermentation responsible for lactic acid and characteristic flavour formation was influenced by the use of starter culture and was accelerated by high holding or incubation temp. Inoculation with strong fermenters allowed adequate fermentation in 16 h at 41°C. Subsequent 8 h smoking completed the whole process in 1 day. RM

31

Studies on preservation of poultry meat by curing and smoking.
Sharma, N.; Mahadevan, T. D.; Panda, B.
Indian Food Packer **27** (5) 12-20 (1973) [20 ref. En] [Indian Vet. Res. Inst., Izatnagar, U.P., India]

The preservation of poultry meat at room temp. (25-26°C) and refrigeration temp. (5-6°C) after curing and smoking was studied. Birds processed by the usual methods were immersed for 72 h at 5-6°C in a curing solution containing 13.6% NaCl, 0.21% $NaNO_3$, 0.28% $NaNO_2$ and 6.8% sugar, washed and smoked for 4 h in hardwood smoke at 40-45°C, and stored at the 2 temp. specified. Samples were taken at 48 h intervals for bacteriological analysis, after 4 and 8 days storage for chemical analysis, and after 8 days for cooking, and organoleptic evaluation and chemical analysis of cooked meat. Bacteriological examination showed that at room temp. untreated controls became unfit for human consumption within 24 h, cured birds were edible for 4 days, and cured smoked birds for 14 days. At refrigeration temp. controls remained edible for 10 days, cured birds for 18 days, cured smoked birds for 30 days. Organoleptic evaluation showed highest preference for the flavour and colour of refrigerated cured and cured smoked meat, followed by cured smoked meat kept at room temp.; no significant difference between room temp. and refrigerated storage for juiciness and tenderness was observed. RM

32

[The effect of various thermal processing techniques used with cured Hamburg bacon, on the quality of the final product.]
Rankov, M.; Skenderovic, I.; Skenderovic, B.; Adam, I.
Tehnologija Mesa **15** (11) 328-331 (1974) [4 ref. Sh, en] [OOUR Proizvodnja, Yugoslavia]

The effects of thermal processing techniques on the wt. losses and quality of Hamburg bacon sides were studied; marbled bacon sides were chilled for 24 h, injected with 10% curing brine (16° Baume) and held for 24 h in the curing brine. 4 thermal processing techniques were studied: (i) baking in hot lard to a core temp. of 68-70°C; (ii) smoking for 3 h in a rotary smoking unit (at 60-80°C) to a core temp. of 46-48°C, followed by heating for 90 min in hot water (80°C) to a core temp. of 68-70°C; (iii) smoking in an 'Atmos' smoking unit for 7.5 h at 65-80°C; and (iv) smoking and baking by standard methods for 48 h at 60°C. Tables of results are given for wt. losses and quality. (iii) gave the lowest and (i) the highest wt. losses. All processes gave bacon of acceptable quality; (i) had the best taste and softness, and (iii) gave attractive appearance and colour. Keeping quality of bacons made by the various processes is discussed. STI

33

Toxicological evaluation of some food colours, thickening agents, and certain other substances. Nineteenth report of the Joint FAO/WHO Expert Committee on Food Additives.
World Health Organization, Joint FAO/WHO Expert Committee on Food Additives; Food & Agriculture Organization, Joint FAO/WHO Expert Committee on Food Additives
WHO Food Additives Series No. 8, 89pp. (1975) [many ref. En] [Geneva, Switzerland]

This monograph gives an account of all biochemical and toxicological data made available to the FAO/WHO Expert Committee on Food Additives, which met in April 1975, for the following substances, together with references for each substance, and an estimate of acceptable daily intake (given in parentheses, mg/kg body wt.). Food colours - amaranth (0-0.75), ferrous gluconate (no upper limit specified), quinoline yellow (0-0.5); thickening agents - carob bean gum, guar gum, tara gum, microcrystalline cellulose (all not specified), pectin (amidated) (0-25); miscellaneous food additives - dichlorofluoromethane (0-1.5), tertary butyl hydroquinone (0-0.75), triacetin (not specified). This monograph is also issued as FAO Nutrition Meetings Report Series No. 55A. [See also FSTA (1976) **8** 4T171.] AL

34

[Phenol content of processed cheeses in relation to extent of smoking.]
Aleksieva, P.; Prodanski, P.
Khranitelna Promishlenost **24** (1) 8-10 (1976) [3 ref. Bg]

Samples of sausage-shaped processed cheese were smoked at low-temp. for 4 or 8 h (internal temp. after 4 h, 30-32°C) and phenol content of sausage at different depths from the paper wrapping and of the wrapping itself were determined by an indophenol colour reaction. Contents in cheese ranged from 0 in the layer at a 1.5 cm depth from the wrapping to 1.0-3.2 mg% in the layer at 0.5 cm depth after smoking for 4 h and to 2.3-4.5 mg% in that layer after smoking for 8 h. Quantities in the wrapping paper were 7-9 mg% after 4 h and 27-29 mg% after 8 h. SKK

35

[Structure formation in smoked and non-smoked raw sausage. I.] Besonderheiten der Strukturbildung von geräucherten und ungeräucherten Rohwürsten. (I).
Sokolow [Sokolov], A. A.; Tschechowskaja, W. T. [Chekhovskaya, V. T.]
Fleisch **30** (1) 15-17 (1976) [De] [Moskauer Tech. Hochschule der Fleisch- & Milch-Ind., Moscow, USSR]

Structural changes in raw sausages are discussed with reference to: disruption of the original muscle structure during comminution; structure formation in the sausage emulsion as a result of protein aggregation (H-bonds, sulphide bonding and ionic bonding); effects of muscle proteases and microbial proteases; effects of changes in temp. and moisture content during smoking and ripening; and effects of interaction between smoke constituents and sausage constituents. IN

36

Behaviour of Salmonella organisms during sausage production.
Kossakowska, A.; Wojton, B.; Widenska, T.
Bulletin of the Veterinary Institute in Pulawy **18** (3/4) 57-61 (1974) [12 ref. En] [Dep. of Hygiene of Anim. Products, Vet. Res. Inst., Pulawy, Poland]

Samples of sausage emulsion were inoculated with 24-h cultures of either Salmonella typhimurium or Salm. choleraesuis, to give counts of 10^3, 10^4 or 10^6 cells/g. Control samples were not inoculated. The emulsion samples were then used for manufacture of cooked cured sausages. Samples were tested for salmonellae after holding for 12 h at 4°C (i.e. before curing), after curing, after smoking (at 45-80°C for 80 min), after cooking (70-78°C for 20 min), and after storage for 48 h at 8°C. Tables and graphs of results are given. No salmonellae were detected in the non-inoculated samples. Counts of both Salmonella spp. increased during curing; both spp. were destroyed during cooking. Salm. choleraesuis was more sensitive to processing conditions than Salm. typhimurium. AJDW

37

Combination meat smoking device and merchandise display case.
Canright, B. W.
United States Patent 3 942 425 (1976) [En]

The device consists of a base of refractory material and a transparent, illuminated smoking cylinder in which meat is suspended from hooks. An electric motor is used to rotate the cylinder and a heating element is incorporated into the circuit. GL

38

Studies on smoke curing of tropical fishes.
Devadasan, K.; Muraleedharan, V.; Joseph, K. G.
Fishery Technology **12** (1) 77-80 (1975) [16 ref. En] [Cent. Inst. of Fisheries Tech. Unit., West Hill, Calicut-673005, Kozhikode, Kerala, India]

Studies on smoke-curing of mackerel (Rastrelliger kanagurta), catfish (Tachisurus dussumeri) and sole (Cynoglossus dubis) are described. Gutted washed fish were dipped for 15 min in (i) saturated brine, (ii) saturated brine containing 3% sodium propionate or (iii) a saturated aqueous turmeric extract saturated with NaCl. All samples were then smoked, sun-dried to approx. 20% moisture, and stored for ≤24 wk at room temp. in sealed glass jars. Changes in volatile basic N concn. and organoleptic properties, and onset of infestation with mites and fungi were studied. A table of results is given. (i)-treated samples spoiled within 3 months; (ii)- and (iii)-treated products remained in good condition for 6 months. Because of the availability and consumer acceptability of turmeric, treatment (iii) is recommended. AJDW

39

Effect of sodium nitrite and sodium chloride on the flavor of processed pork bellies.
Kimoto, W. I.; Wasserman, A. E.; Talley, F. B.
Lebensmittel-Wissenschaft + Technologie **9** (2) 99-101 (1976) [15 ref. En] [USDA, E. Regional Res. Cent., 600 East Mermaid Lane, Philadelphia, Pennsylvania 19118, USA]

Fresh pork bellies (rind removed) were pumped to 110% of green wt. with curing pickles containing: NaCl + $NaNO_2$; NaCl; or $NaNO_2$. Pumped and unpumped (control) bellies were stored in polyethylene bags at 34°F for 18-24 h then cut in half. One half of each belly was processed with smoke and the other without smoke until the temp. reached 127°F. Processed bellies were stored at 34°F for 12-18 h, then placed in a freezer for 1.5-2 h to harden tissues, sliced about 2 mm thick, fried for 5 min and submitted to sensory evaluation. Results were subjected to statistical analyses. Most of the difference among treatments was due to the effect of NaCl. Bacon cured with NaCl alone was rated as having only slightly less flavour than the control, while in the absence of NaCl much flavour was noted. Presence of $NaNO_2$ in the curing pickle also had a significant effect on flavour; in the presence of NaCl, the expected enhanced flavour due to $NaNO_2$ was obtained. However, $NaNO_2$ alone could not evoke the same level of response as the control. Panelists readily identified samples processed without NaCl and gave them low flavour scores. The effect of smoke was not significant. JA

40

[Product examination of coal-tar dyes. XIV. Results of the product examination of coal-tar dyes and coal-tar aluminium lakes from April 1974 to March 1975.]
Iwaida, M.; Iga, S.; Nakamura, K.; Yamaji, A.; Ueda, K.; Nishikawa, M.
Bulletin of the National Institute of Hygienic Sciences [Eisei Shikenjo Hokoku] **93**, 125-127 (1975) [4 ref. Ja, en] [Nat. Inst. of Hygienic Sci., Tokyo, Japan]

The numbers of dyes inspected during this period were 410 in all, a decrease of 316 (43.5%) compared with the previous period. Numbers of Food Red. No. 102 (new coccine) and Food Yellow No. 5 (Sunset Yellow FCF) inspected reduced by more than a half. Decreases were found in the numbers of 9 coal-tar dyes inspected, while only Food Red No. 2 (amatanth) increased double in the number inspected. Dye lakes inspected were 39 in all, reducing by more than a half compared with the previous period. More than 60% of the dye lakes inspected were occupied by Food Red No. 5 Aluminium Lake. 15 samples of Food Red No. 2 were condemned by the presence of other colouring matter (Fast Red E) on paper chromatogram, while 2 samples of Food Red No 3 (erythrosine) were rejected because 1% solutions of them showed too low pH values. 2 samples of Food Red No. 5 Aluminium Lakes were condemned by the presence of subsidiary colouring matters on paper chromatograms. [See FSTA (1975) **7** 12T602 for part XIII.] AS

41

[Subsidiary dyes in Food Yellow No. 5 (Sunset Yellow FCF).]
Iwaida, M.; Kaneda, Y.; Ito, Y.; Tonogai, Y.
Bulletin of the National Institute of Hygienic Sciences [Eisei Shikenjo Hokoku] **93**, 127-129 (1975) [2 ref. Ja, en] [Nat. Inst. of Hygienic Sci., Tokyo, Japan]

Japanse Standards of Food Additives (Ed. 3) prescribe that subsidiary dyes in coal tar dyes are to be monitored by sub-spots on paper chromatograms. An attempt was made to quantify the amounts of subsidiary dyes in Sunset Yellow FCF. AOAC official first action procedure was applied for the detn. of a lower sulphonated dye (orange II), while a partially modified AOAC technique was used for the detn. of higher sulphonated dyes (R salt and G salt isomers). About 0.4% of lower sulphonated dye and 1.2% of higher sulphonated dyes were presented in 3 samples of a commercial preparation of Sunset Yellow FCF to be used as a food additive. [From En summ.] JRR

42

[The effect of smoking dried fish products on the stability of lipids to oxidization.]
Shevchenko, M. G.; Lapshin, I. I.
Rybnoe Khozyaistvo No. 11, 74-76 (1975) [2 ref. Ru] [MINKh im. G. V. Plekhanova, USSR]

Changes in properties of lipids in dried fish products, either smoked conventionally or by smoking liquid, were investigated during storage. Chemical composition of fish products (moisture, fat, nitrogenous substances, salt) and lipid characteristics (acid number, peroxide and I value, contents of tri-, di- and monoglycerides, free fatty acids, phospholipids, cholesterol, hydrocarbons) is presented. The products smoked in the 2 ways were organoleptically identical, having good flavour and taste. The combined (smoking liquid) process imparted 1.5-2% more moisture. More intensive hydrolysis of fats took place in conventionally smoked fish, producing loss of quality; the fish were grade II after 45 days, vs. 60 days for fish smoked using the smoking liquid. STI

43

[Combined hot-smoking and cooking equipment for use in meat processing plants of various sizes.]
Kombinierte Heissrauch- und Kochanlagen für jede Betriebsgrösse.
Lange, W.
Fleischerei **27** (1) 43-46 (1976) [De] [Im Ginsterbusch 7, D-2000 Hamburg 61, Federal Republic of Germany]

44

[Method for production of wet-smoked sausages.]
Borovskii, V. R.; Kravets, S. S.; Alekseenko, V. E.; Kremnev, O. A. (**Union of Soviet Socialist Republics**, Institut Tekhnicheskoi Teplofiziki AN Ukrainskoi SSR)
USSR Patent 518 203 (1976) [Ru]

Product quality is improved and process time reduced by preparing the filling, subjecting part of this to smoking and drying to a moisture content of 35-45%, filling into a casing so that the pre-smoked filling is located in the centre and is surrounded by a 5-10 mm thick layer of non-smoked filling, then completing the smoking and drying of the product. W&Co

45

[Investigation of bacterial flora in canned frankfurters.]
Popovic, P.; Petrovic, B.
Tehnologija Mesa **16** (12) 338-343 (1975) [18 ref. Sh, en] [Centrocoop Export-import, Belgrade, Yugoslavia]

The bacteriological quality of frankfurters was evaluated before smoking, after smoking, and after cooling (before placing in cans). Data are given for total counts, and counts of thermophilic, aerobic and anaerobic bacteria. The most common species of bacteria in frankfurters are listed. Heat treatment (smoking, boiling) considerably reduced total counts, and eliminated Gaffkya, Sarcina, Pseudomonas, Proteus, Escherichia and Klebsiella spp.- STI

46

[Effects of conventional smoking and liquid smoke treatment on the quality of pork sausages.]
Lee, J. M.; Song, K. W.
Korean Journal of Animal Science **17** (5) 511-529 (1975) [155 ref. Ko, en] [Livestock Exp. Sta., Suweon, Korea]

Effects of (i) conventional smoking and (ii) liquid smoke treatment (using liquid chestnut or oak smoke, added at concn. of 0.4, 0.8 or 1.2%) on the quality of pork sausages were studied. Tables of results are given for sausage yield, palatability, flavour, hardness, chewiness, gumminess, and changes in wt., pH, colour and volatile basic N concn. during storage for ≤21 days. The results show that (ii) gave higher yield, inferior palatability and flavour, higher pH of the stored product, and less intense colour than (i). Smoking method had no significant effect on the other characteristics studied. The correlation coeff. between pH and colour, between pH and volatile basic N concn. and between colour and volatile basic N concn. were -0.7469, 0.6493 and -0.8531 respectively. [From En summ.] AJDW

47

[Semi-automatic thermal processing of some types of sausages.]
Bucar, F.; Fröhlich, A.
Tehnologija Mesa **16** (5) 130-132 (1975) [6 ref. Sh, en] [Biotechniska Fak., Ljubljana, Yugoslavia]

A semi-automatic line for smoking and heat treatment of sausages is described. Equipment includes a thermostatically controlled smoking chamber (smoke being produced by IR heating of wood chips) with natural air circulation; a steaming chamber (air circulation being aided by a fan); and a cooling chamber equipped with a cold water spray device. The line has a capacity of 150 kg sausages. Temp. distribution and wt. losses were determined during processing of 'Paris', 'Common', 'Ljubljana', 'Tyrolean' and 'Kran' sausages. Diagrams of results are given. STI

48

[How dangerous are smoke-flavoured seasonings? The significance of benzopyrene as a carcinogen.]
Wie gefährlich ist das Rauchwürzen? Allgemein verständliche Betrachtung über die Mengenbegrenzung des Benz(a)pyren als Leitsubstanz der Räucherkrebserreger.
Henning, W.
Ernährungswirtschaft No. 3, 108 (1976) [De]

Legislation in the Federal Republic of Germany permits addition of smoke-flavoured seasonings to meat products; these seasonings contain 8-20 µg benzopyrene/kg. At the max. dose of 5 g seasoning/kg meat product, the max. benzopyrene concn. in the product is 0.04-0.1 µg/kg; this is

below the German tolerance of 1 μg/kg meat, and considerably less than the quantity of benzopyrene to which people are exposed in cigarette smoke, vehicle exhaust gases, industrial waste gases, etc. IN

49

Oven for cooking food by a hot smoke process.
Decuir, A.
United States Patent 3 961 571 (1976) [En]

An oven with an automatic temp. control for hot smoking of food includes a grate for wood, a base of fire bricks or insulated metal and a hood with transparent glass panes. Flavour is imparted to the food from the burning wood, which is ignited by a gas burner. GL

50

[Effect of processing anchovy kilka on fraction composition of its proteins.]
Abdurakhmanov, Yu. A.; Aliev, V. A.
Rybnoe Khozyaistvo No. 3, 69-71 (1976) [Ru] [Inst. Zoologii AN AzSSR, USSR]

The content of various fractions of protein and non-protein nitrogenous materials in fresh, salted and smoked kilka (Clupeonella engrauliformis) was studied, and composition of myofibrillar and sarcoplasmic proteins was determined by gel filtration on Sephadex G-100. When processing kilka, changes occurred in the relationship of individual protein fractions; the quantity of sarcoplasmic, and particularly myofibrillar proteins, decreased, and the quantity of denatured proteins increased. An increase of non-protein nitrogenous material was also noted. At smoking, G-Actin and tropomyosin disappeared from myofibrillar proteins. Among sarcoplamic proteins, the content of a globulin fraction and myogens considerably decreased, but the quantity of low-molecular proteins increased. The quantity of muscle albumin was practically unchanged. STI

51

[Investigations into aroma compounds of seasonings treated with liquid smoke.]
Untersuchungen über Aromastoffe bei mit Dampfrauch geräuchertem Gewürz.
Keller, G.; Günther, H. O.
Fleischwirtschaft 56 (4) 564-566, 569-570 (1976) [23 ref. De, en, fr] [Landesuntersuchungsamt fpr das Gesundheitswesen Südbayern, Aussenstelle Augsburg, Fritz-Hintermayr-Strasse 3, 8900 Augsburg, Federal Republic of Germany]

The compounds and flavour formed during liquid smoking of spices were studied by chemical and sensory examination. Spices were smoked at 300°, 330°, 360° and 390°C and examined in salt solution and after incorporation into Frankfurter-type sausages. Carbonyl compounds + phenols in smoked spice increased with temp. from 64 mg/100 g at 330°C to 88 mg/100 g at 390°C (amounts at 300°C were not measurable). In sausages, concn. of organic acids and phenols did not rise very much, but carbonyl compounds increased considerably. TLC and IR spectroscopy of DNPH (2,4-dinitrophenylhydrazine) derivatives showed that except for acetol none of the compounds had previously been identified in smoke. The bulk of the compounds formed were aromatic hydroxymonocarbonyls, possibly formed by introduction of hydroxy groups into carbonyls by the superheated steam. Sensory tests showed that both the smoked seasoning and sausages were preferred to commercial products. Liquid smoking produced a mild, pleasant, rounded aroma lacking the sharp, pungent smoke flavour. All samples contained <1 part/billion 3,4-benzpyrene. RM

52

[The effect of relative humidity of air in the smoking equipment "Atmos" on weight losses and on some properties of the product.]
Stamenkovic, T.; Ristic, D.; Stanimirovic, D.; Blazic, Z.
Tehnologija Mesa 16 (6) 172-174 (1975) [11 ref. Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

The effects of the RH in Atmos smoking units on the wt. loss, moisture content, fat content and organoleptic properties of meat products were studied. 3 processes were tested, differing in RH and temp. during pre-drying and hot smoking; cooling methods also differed. Tables of results are given. Wt. losses and organoleptic properties of the product were found to be dependent on RH. STI

53

[Smoking of chicken meat.]
Park, S. Y.; Youn, J. E.; Lee, Y. K.
Korean Journal of Animal Science 15 (3) 230-233 (1973) [13 ref. Ko, en] [Kon Kuk Univ., Seoul, Korea]

Studies on curing and smoking of (i) culled chickens and (ii) broilers of various live wt. classes are described. Tables of data are given for wt. changes, and changes in the composition of the meat at various stages of processing. (ii) gave better results than (i); (ii) of live wt. approx. 1300 g were the most suitable, Yield (after processing) was 51.6% for (i), and 58.9-60.3% for (ii) (depending on live wt.) The salt content of chicken meat increased with increasing curing time; moisture content first decreased, then increased to a value slightly lower than the initial value. Boiling for 30 min, followed by drying for 1 h and smoking for 2 h at 40°C is recommended. [From En summ.] AJDW

54

Food colours - harmless aesthetics or epicurean luxuries? [Review]
Drake, J. J. P.
Toxicology 5 (1) 3-42 (1975) [148 ref. En] [British Ind. Biol. Res. Ass., Woodmansterne Road, Carshalton, Surrey, UK]

The toxicological data concerning food colours are reviewed, and the progress made towards

definition of safety standards is examined. The subject is divided into discussion of naturally derived colouring materials, (carotenoids, other natural plant pigments, pigments of animal origin and metals and their oxides), and of synthetic materials, including water-soluble azo-dyes, azopyrazolone colours, triphenylmethane colours, indigoid and xanthene dyes, anthroquinones and caramel colours. JRR

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FAB 18

SMOKED FOOD PRODUCTS

SELECTED FROM VOLUME 9
FOOD SCIENCE AND TECHNOLOGY ABSTRACTS

under the direction of

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H. BROOKES
ASSISTANT EDITOR

1

Smoking apparatus.
Huang, M.; Walter, N. F. (DEC International Inc.)
United States Patent 3 969 996 (1976) [En]

Food smoking apparatus includes an air heater external of a vaporizing chamber and means for producing a flow of air heated to ≥500°F into the chamber. IFT

2

Improvement in the technology and the subsequent stability of hot-smoke fish curing in West Afrika.
Caurie, M.
Dissertation Abstracts International, B **36** (11) 5498-5499 Order No. 76-4965 (1976) [En] [Univ. of Rhode Island, Kingston, Rhode Island 02881, USA]

An oven based on a traditional smoking oven was used to smoke butterfish (Poronotus triacanthus) and a study made of effect of temp., pre-smoking treatment and smoke velocity on nutritional quality of and smoke absorption by fish. During smoking there was an initial rapid increase in fish internal temp. which facilitated protein denaturation. Smoke deposition on fish depended on whether the smoke could escape freely or was held in the oven. Smoke absorption was favoured when smoke was not circulated under the latter conditions but depended on forced air flow under the former conditions. Phenol content of smoked fish was positively correlated with hydroxyproline content and colour of fish. It is suggested that hydroxyproline interacts with phenols to provide a firm stable surface that resists breakage during smoking. The apparent loss of total protein and level of sulphydryl in smoked fish are a function of amount of water lost during processing. Brining before smoking limits apparent loss of fish proteins. A general water sorption isotherm equation was formulated to identify the unimolecular layer of absorbed moisture generally believed to be optimal in dehydrated materials during storage. For storage of dry smoked fish with other dehydrated materials, a second equation was derived which predicts final equilibrium humidity conditions in a package for the necessary moisture adjustments to be predetermined to avoid moisture transfer in storage from one side of the package to the other. JA

3

[Is there a danger of mycotoxins in Hungarian salami? II. The importance of the casing and of smoke treatment.] Besteht eine Mykotoxingefahr bei der ungarischen Salami? II. Die Bedeutung der Hülle und der Räucherung.
Incze, K.; Frank, H. K.
Fleischwirtschaft **56** (6) 866-868 (1976) [4 ref. De, en, fr] [Ungarisches Forschungsinst. für Fleischwirtschaft, Gubacsi ut. 6/b, H-1097 Budapest, Hungary]

The effects of temp., water activity (a_w), mixed flora and the medium on mycotoxin production, and of smoking on mould growth were studied, as well as penetration of synthetic casings and packaging materials by fungal hyphae, and diffusion of toxins. Nalo, Naturin, Hukki, cellophane and parchment casings allowed variable amounts of penetration by Aspergillus flavus, strain 373, A. parasiticus 403 and A. versicolor 519, 552 and H_{22} during 25 days at 30°C. Hukki and parchment were penetrated in every case, the others only in place with an air space between the substrate and covering material (i.e. imperfect adhesion). None of the materials prevented diffusion of toxins. Given good adhesion, the Nalo and Naturin casings reduced the growth of the fungi. No toxin was formed when toxigenic strains were grown for 30 days in combination with the mixed salami culture at 13°C. Smoke treatment of the casings (soaking in a solution of smoke components) reduced the growth of toxigenic fungi without affecting the normal ripening flora. [See FSTA (1976) 8 9S1453 for part I.] RM

4

[Spectrophotometric determination of phenols in smoking liquids.]
Rusanov, V. V.
Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 1, 50-51 (1976) [Ru] [Moskovskii Ordena Trudovogo Krasnogo Znameni Inst. Narodnogo Khozyaistva im. G. V. Plekhanova, USSR]

Smoke concentrates used for smoke flavoring of foods were analysed as follows: 5 ml of smoking liquid was placed in a round bottom flask containing 70-75 ml distilled water and 5 ml of 10% aqueous solution of tartaric acid. The phenols present were then steam distilled into a 200 ml flask, the distillate was made up to vol. and aliquots were measured at 275 nm. Contents of total phenols were found in tables prepared from standard samples. Sensory analyses showed that the content of phenols in smoking liquids for fish should be 50-60 mg%. STI

5

[New-design smoke generators.]
Gergel', B. E.
Rybnoe Khozyaistvo No. 4, 68-69 (1976) [Ru] [CPKTB "Azcherryba", USSR]

The generators are manufactured in 2 variants: 500 m^3/h capacity (N10-IDG type) and 1000 m^3/h capacity (N10-IDG-1 type). The smoke generator consists of a cylindrical body with water-jacket, holding a sawdust container, and a chamber, ash bin and inertia smoke scrubber with a filter. Sawdust consumption is 13-20 and 15-25 kg/h, respectively; the smoke mix temp. ranges from 40° to 120°C. Combustion intensity, density and temp. of the smoke/air mixture are controlled by air feed unit. STI

6

[Changes of some morphometric properties of Baltic herring by hot smoking.]
Nikitin, B. N.; Alymov, V. T.; Stolin, L. M.
Rybnoe Khozyaistvo No. 5, 69-70 (1976) [2 ref. Ru] [NIKIMRP, USSR]

Changes of dimensions, wt. and vol. of Baltic herring caused by hot smoking were investigated to find ways of mechanizing the manufacture of smoked fish in oil. Average decreases from hot smoking were: 2.4% length, 2.7% height, 3.7% back width, and 18.3% wt. and vol. As back width is a criterion for classification of fish for this process, equations showing the dependence of the other parameters on back width are presented. STI

7

[Polycyclic aromatic hydrocarbons in smoked and grilled meat products.] Polycyclische aromatische Kohlenwasserstoffe in geräucherten und gegrillten Fleischerzeugnissen. (In 'Rückstände in Fleisch und Fleischerzeugnissen' [see FSTA (1977) **9** 2S164].) [Lecture]
Potthast, K.; Hamm, R.
pp. 149-166 (1975) [47 ref. De, en] [Inst. für Chemie & Physik, Bundesanstalt für Fleischforschung, 865 Kulmbach-Blaich, Federal Republic of Germany]

The occurrence and concn. of 3,4-benzpyrene and other polycyclic aromatic hydrocarbons in smoked meat products are discussed, on the basis of literature data. Aspects considered include: legal aspects; carcinogenicity of hydrocarbons in smoked meats; carcinogenic hydrocarbon concn. in smoked meats (most smoked products containing 1 part/billion of 3,4-benzpyrene, although 'black' smoked products may contain 55 parts/billion); and polycyclic aromatic hydrocarbon concn. in liquid smoke preparations. Concn. of polycyclic aromatic hydrocarbons in grilled foods is also discussed, with reference to effects of grilling method, the fat content of the meat product, and the orientation of the heat source (below or to the side of the food). AJDW

8

[Secondary smoking of in particular sausage products in a casing.] Sekundärräucherung von insbesondere Fleischwurstwaren im Darm.
Henning, W.
German Federal Republic Patent Application 2 447 911 (1976) [De]

A process for secondary smoking of sausages which prevents the fine smoking aromas from being surrounded by fatty components of the mix comprises surrounding the sausage product with a layer of an adhesive mass containing smoked food products, by means of dipping, pouring or spraying, and drying the sausage product. The smoking aromas from the dried coating penetrate the moist contents of the casing within 24-28 h. W&Co

9

[Aroma compounds in the steam-smoking method for manufacture of meat products.] Aromastoffe bei der Dampfrauchtechnik zur Herstellung von Fleischwaren.
Günther, J. P.
Fleischerei **26** (11) 13 (1975) [De] [Landesuntersuchungsamt für das Gesundheitswesen Südbayern, Aussenstelle Augsburg, D-89 Augsburg, Postfach 111 924, Federal Republic of Germany]

10

[Survey of polynuclear aromatic hydrocarbons (benzo(α)pyrene) in food additives. II. Liquid paraffin and liquid smoke flavour.]
Hirokado, M.; Endo, F.; Usami, H.; Fujii, T.
Annual Report of Tokyo Metropolitan Research Laboratory of Public Health 26 (1) 220-224 (1975) [5 ref. Ja, en] [Tokyo Metropolitan Res. Lab. of Public Health, 24-1, Hyakunincho 3 chome, Shinjuku-ku, Tokyo 160, Japan]

Recovery of 50 ng of benzo(α)pyrene added to 100 ml samples of liquid paraffin and 100 ml samples of liquid smoke flavour was 76.8-82.8% and 47.0-55.2%, respectively. The method used for the quantitative detn. of benzo(α)pyrene involved clean-up, liquid-liquid partition, alumina column chromatography and spectrophotofluorimetry. The benzo(α)pyrene content of 4 commercial liquid paraffins ranged from 0.1 to 0.18 parts/billion. The benzo(α)pyrene content of 11 liquid smoke flavours was <0.1 parts/billion (the min. detection level). [From En summ.] [See FSTA (1976) **8** 9T481 for part I.] JA

11

Inhibition of aflatoxin accumulation in smoked substrates.
Arseculeratne, S. N.; Samarajeewa, U.; Welianga, L. V.
Journal of Applied Bacteriology 41 (2) 223-233 (1976) [22 ref. En] [Dep. of Microbiol., Fac. of Med., Univ. of Sri Lanka, Peradeniya, Sri Lanka]

The pattern of fungal colonization on processed (smoked) copra kernels and the levels of aflatoxin detected in copra and in a culture of Aspergillus flavus on fresh coconut suggested that aflatoxin accumulation was inhibited by the smoking process. This paper describes a study of the smoking process under laboratory conditions with fresh coconut and potato dextrose broth; aflatoxin accumulation was found to be significantly or totally inhibited in both smoked coconut and in smoked broth. Mycelial growth was inhibited to a lesser degree. On account of the urgent need for simple, cheap and efficent techniques for the processing and safe storage of food substrates, especially in poor tropical countries, the authors suggest that the smoking process deserves study under industrial conditions for the protection of other agricultural food crops (e.g. groundnut). AS

12

[Technological utilization of mandi fish: cold smoking.] [Lecture]
Andrade, M. O. de; Almeida Lima, U. de
Revista Brasileira de Tecnologia 6 (2) 201-206 (1975) [7 ref. Pt, en] [Dep. de Tecnologia Rural, Escola Superior de Agric. Luiz de Queiroz, Univ. de Sao Paulo, CP9, 13400 Piracicaba, Sao Paulo, Brazil]

Preservation by cold smoking of mandi, a Brazilian species of cat-fish (Pimelodus clarias Lacepede) was studied. Fresh fishes were eviscerated, dry-salted, cured and smoked. Taste tests showed that the best results were obtained by salting with 10% (by wt.) fine grained dry salt and by curing for 10 h under refrigeration at 0-5°C. After curing, the fishes were dried by exposure to the sun or to an air current at 40°C in a dryer. Afterwards, the fishes were submitted to dry-heating in a smoker at 60-70°C for 30 min. Then, smoked fishes were packaged in Al foil and stored for 7 days at room temperature, without any humidity control, or for 30-40 days in a refrigerated chamber at 0-1°C. The smoked fish were classified as good by taste tests. After 40 days, a panel test of the smoked fishes revealed good texture, odour and appearance. Chemical analysis showed 68.9% moisture, 17.8% protein, 12.4% lipids and 0.9% ash. The fish were caught in May and June, when they have the lowest contents in fat. No apparent growth of microorganisms was microscopically detected on the smoked fishes after storage at both refrigeration and room temp. AS

13

[Modern smoking of fish without pollution of the environment.]
Koop, L.
Voedingsmiddelentechnologie 9 (10) 16-17 (1976) [Nl] [Seffelaar & Loogen BV, Oldenzaal, Netherlands]

Fish smoking is discussed, with reference to: the preservative effect of smoking; salting and/or drying before smoking; disadvantages of the traditional drying process; required characteristics of an improved automatically controlled system; and methods for disposal of waste smoke without air pollution. AJDW

14

[Phenolic substances in 'smoked fish in oil', prepared using a variety of techniques.]
Rodina, T. G.; Kotlyar, V. I.
Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 3, 43-46 (1976) [7 ref. Ru] [Moskovskii Ordena Trudovogo Krasnogo Znameni Inst. Narodnogo Khozyaistva im. G. V. Plakhanova, USSR]

The smoked fish in oil (Baltic sprat) processed using smoking liquid (applied during salting or during aromatizing of the brining olive oil) or smoke, showed a variable spectrum of phenolic compounds. These were determined by paper chromatography; a total of 16 components were found. When smoking liquid is used (to salt or aromatize) the phenols composition approaches that of smoke-processed sprats. Application during salting is simple, the results being similar to those achieved by conventional smoking. STI

15

[Benzo(a)pyrene contents of smoked fish in relation to smoking procedure.] 3,4-Benzpyren-Gehalte in geräucherten Fischen in Abhängigkeit von der Räuchermethode.
Steinig, J.
Zeitschrift fuer Lebensmittel-Untersuchung und -Forschung 162 (3) 235-242 (1976) [8 ref. De, en] [Bundesforschungsanstalt für Fischerei, Inst. für Biochemie & Tech., Palmaille 9, D-2000 Hamburg 50, Federal Republic of Germany]

A study was made of the benzo(a)pyrene content of a total of 32 samples of fish which had been subjected to either direct, hot indirect or cold indirect smoking. The fish included eels, mackerel, dogfish, halibut, buckling, sprats and Atlantic salmon. The benzo(a)pyrene content of 14 samples of canned smoked fish (sprats in oil, saithe in oil, eel in aspic, Atlantic salmon in oil, mackerel fillets in oil) was also studied. Results are detailed in tables. The method used for determining benzo(a)pyrene involved extraction, column chromatography, TLC and measurement of the fluorescence of eluted benzo(a)pyrene. Fish smoked by indirect methods contained <1 part/billion benzo(a)pyrene in their edible tissues. Direct smoking generally produced benzo(a)pyrene contents >1 part/billion in the edible tissues. The benzo(a)pyrene content in the edible tissues of canned products ranged from 0.31 (eel in aspic) to 3.7 parts/billion (sprats in oil). JA

16

[A comparative analysis of distribution of flows of air/smoke mixture inside tower smoking ovens.]
Bunin, D. Kh.; Popov, M. V.
Rybnoe Khozyaistvo No. 6, 70-72 (1976) [Ru] [VNIRO, USSR]

Giprorybprom tower smoking ovens (8.05 m^2 in cross-section, 25 m in height) and Tekhrybprom ovens (3.55 m^2 cross section, 16 m height) were investigated; both are equipped with identical systems of preparation and feed of air/smoke mixture. The index is the amount of smoke at individual measuring stations. In the former installation only half the smoke generator capacity was exploited (1000 m^3), the performance being impaired due to several leakage points, and flow distribution was highly non-uniform. The latter installation made full use of the smoke generator capacity, producing more concentrated smoke and more evenly distributed flows. A common shortcoming of both systems is that air/smoke parameters cannot be adapted to the particular fish being processed. STI

17

[Salting, smoking and semi-preserving marine animal foods. Techniques, regulations and statistics. Future prospects.]
Remy, D.
Industries Alimentaires et Agricoles 93 (9/10) 1175-1183 (1976) [Fr, de, en]

The production of salted, smoked and semi-preserved herrings and anchovies, other smoked fish and fish roes (caviar and caviar substitute) is reviewed with notes on preparation, control, and production statistics for 1975. RM

18

[The effect of processing on organophosphorus pesticide residues in meat.] Die Dynamik der Rückstände von Organophosphat-Pestiziden bei der Verarbeitung von Fleisch.
Gajduskova, V.
Fleischwirtschaft 56 (10) 1505-1506 (1976) [5 ref. De, en, fr] [Forschungsinst. für Veterinärmed., Hudcova 70, 62132 Brno, Czechoslovakia]

6 organophosphorus pesticides (malathion, fenitrothion, thiometon, disulfoton, parathion and methyl parathion) were added to beef and pork and the effects of processing and storage on residue concn. were studied. In beef, the pesticides were quickly broken down after boiling or storage at +4°C, except for disulfoton. Thiometon was destroyed by boiling but not by +4°C storage. 155 days' storage at -25°C resulted in disulfoton residues of 9.5-78.4% of the original levels. When pork was stored and grilled, residue levels did not drop to <50% of initial levels, and remained at 100% for disulfoton, thiometon and parathion. In cured pork legs, injected malathion was broken down during processing, whereas fenitrothion was rather stable; it was barely affected by smoking and reduced to 41.7% or 79.4% of initial levels after 1½ h boiling. Under the conditions studied, the organophosphorus residues were more stable in pork than in beef. RM

19

The evaluation of some smoke condensates. [Lecture]
Berger, B.; Hemra, L.; Nilsson, R.
Proceedings of the European Meeting of Meat Research Workers No. 21, 184-186 (1975) [7 ref. En, de, fr, ru] [Swedish Meat Res. Cent., 244 00 Kavlinge, Sweden]

Studies on 9 brands of smoke condensates are described. The proportion of non-phenolic compounds in the condensates ranged from 5-10% to 95%. GLC analyses showed 18 peaks in the phenols fraction; 9 of these were identified (guaiacol, cresol, phenol, p-cresol, propyl guaiacol, eugenol, syringol, isoeugenol, vanillin). The quantitative composition of the phenolic fraction differed considerably between condensates. Samples of 'Falu' sausage (a Bologna-type product) made with the 9 condensates were evaluated by a taste panel. Only 4 brands gave acceptable results; all of these had non-phenolic compound concn. in the range 35-80%. The quantitative composition of the phenolic fraction did not appear to be related to sausage quality. Further studies showed that sensory evaluation of smoke condensates suspended in lard gave misleading results. [See FSTA (1977) 9 4S605.] AJDW

20

Smoking apparatus.
West, C. W.
British Patent 1 446 348 (1976) [En]

Ham smoking apparatus comprises a heatable cooking chamber and a closed air treatment system adapted to condense moisture and associated particles to minimize air pollution. IFT

21

[Determination of magnesium content of fish meat and fish products. III. Effect of various technological processes on the Mg content of fish and fish products.]
Kownacki, E.; Doboszynska, B.
Bromatologia i Chemia Toksykologiczna 9 (3) 349-356 (1976) [15 ref. Pl, en, ru] [Inst. Chem. i Analytiki, Akad. Med., Gdansk, Poland]

Thawing of 5 var. of fish (carp, pike-perch, cod, flounder, herring) reduced their mean Mg contents from 17.6 to 12.4 mg% (or from 77.9 to 55.0 mg% in DM), a drop of 30.6%. Smoking of 5 var. of fish (cod, flounder, halibut, mackerel, herring) increased the Mg content from 20.3 to 26.6 mg% (but caused a reduction from 79.5 to 78.7 mg% on a DM basis because of loss of moisture). Brining of 1 var. (cod) reduced the Mg content from 24.6 to 10.0 mg% (from 94.8 to 30.3 mg% in DM), a drop of 59.3%. When 4 var. of fish (cod, flounder, mackerel, herring) were canned in tomato sauce, Mg contents dropped from 18.8 mg% in the raw fish (73.4 mg% in DM) to 16.7 mg% in the canned product (51.5 mg% in DM). A more pronounced drop was observed in 3 var. of fish (cod, mackerel, herring) canned in oil: from 21.3 to 15.9 mg% (from 80.9 to 36.5 mg% in DM). [See FSTA (1977) 9 1R20 for part II.]
HBr

22

[Analysis of a commercial smoke-curing agent. III. Separation and identification of components of low-boiling phenolic fractions.]
Radecki, A.; Lamparczyk, H.; Grzybowski, J.; Halkiewicz, J.; Bednarek, P.; Boltrukiewicz, J.; Rapicki, W.
Bromatologia i Chemia Toksykologiczna 9 (3) 327-332 (1976) [4 ref. Pl, en, ru] [Zaklad Chem. Fizycznei Akad. Med., Gdansk, Poland]

Preparative gas chromatographic analysis of a commercial smoke preparation revealed the presence of 4 compounds in the low-boiling phenolic fraction. Results of NMR, IR and UV spectra analysis have shown similarity of their structures with those of 2-methoxy-4-ethylphenol, 3,4-dimethylphenol, 2-methoxy-5-vinylphenol and 2-methoxy-4-allylphenol. [See FSTA (1976) 8 4R222 for part II.] AS

23

[Smoking and drying of meat and meat product.]
Räuchern und Trocknen von Fleisch und Fleischerzeugnissen.
Reuter, H.
Fleischwirtschaft **56** (11) 1543-1546, 1548, 1550 (1976) [42 ref. De] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

The properties and methods of production of smoked and dried meat are reviewed. Main smoking methods include cold smoking at <500° C, hot smoking, electrostatic smoking (Codrell process), steam smoking (Germos process), 2-step smoking, the friction or fluidization smoke generating process, and the immersion process using condensed smoke. Apart from specialized products like Bündesfleisch, the main dried product is freeze-dried meat. RM

24

[Purification of waste gas from smoking plants.]
Abluftreinigung an Räucheranlagen.
Schuldt, P.
Fleischerei **27** (4) 31-32, III (1976) [De, en, fr] [ALPAS - Schuldt & Kohn, Grossenstrasse 11, D-28 Bremen 1, Federal Republic of Germany]

25

[Phenols in the smoking liquid obtained from lignin.]
Goryaev, M. I.; Bykova, L. N.; Ignatova, L. A.
Rybnoe Khozyaistvo No. 10, 66-67 (1976) [Ru] [IKhN AN KazSSR, USSR]

Lignin is first dried to 5% moisture, then pyrolysed in a furnace with artificial air draught. The smoke formed is passed through water, from which objectionable substances (acetone, methanol, low-molecular fatty acids) are removed after 7-8 h by distillation at 60° C and 15-20 mm Hg pressure. The addition of surface-active materials (esterified sugars) increases the adsorption capacity of the water. 9 phenolic fractions were found by gas chromatography. The lignin smoking liquid imparts a more balanced golden colour to meat products; it participates less in the formation of flavour than do existing smoking liquids. STI

26

[Determination of 3,4-benzopyrene in smoked meat and fish products. II. Quantitative determination of 3,4-benzopyrene in smoked fish.]
Lenges, J.; Luks, D.; Vo Thi, N. B.
Revue des Fermentations et des Industries Alimentaires **31** (1) 20-22 (1976) [6 ref. Fr, nl] [Service de Tech. Alimentaire IIF-IMC, CERIA, 1070 Brussels, Belgium]

Toth's method [see Journal of Chromatography (1970) **50** (1) 72] for determining 3,4-benzopyrene by chromatography was used on 69 samples of 8 var. of smoked fish prepared in Belgium, some in factories, some by traditional methods. The average concn. reached 1.15 ppb, which is 5 times greater than that found in smoked meat samples. For 6 samples of fish smoked at ≤30° C the average concn. was 0.20 ppb, and for 12 samples smoked at 45-70° C it was 0.84 ppb; for samples smoked at 70-80° C the concn. was consistently higher, reaching 11.11 ppb in 1 sample of mackerel. However most meats are smoked at 15-20° C. Other studies with herrings have confirmed that high temp. causes a considerable increase of 3,4-benzopyrene. [See FSTA (1975) 7 11S1521 for part I.] KME

27

[Composition of phenols in smoked fish tissue.]
Korovina, L. M.
Rybnoe Khozyaistvo No. 11, 79-80 (1975) [Ru] [Dal'nevostochnyi Tekh. Inst. Rybnoi Promyshlennosti i Khozyaistva, USSR]

Qualitative composition of phenols isolated from tissue of electrically smoked herring and Oncorhynchus gorbusha were studied. Separation was by paper chromatography. Contents of guaiacol, phenol, 0- and m-cresol and methyl guaiacol were characteristic for the 2 types of fish; resorcin was also characteristic for gorbusha tissue, and n-cresol, o-, m- and n-xylenols and o-cresol for herring. The phenols content was not affected by the smoking technique used (electrostatic, conventional) but certain quality differences were observed; these are explained by the fact that in conventional smoking the smoke particles are precipitated mainly from the dispersion medium while in electrostatic smoking the particles are precipitated mainly from the dispersed phase. STI

28

[Integral technology - a method for improvement o profitability and environmental protection in the manufacture of sausages and meat products.]
Integral-Technologie - eine Methode zur erlössteigernden und umweltfreundlichen Produktion von Fleisch- und Wurstwaren.
Maurer, S.
Fleischerei **27** (4) 83-84, 89; (5) 14-16, I (1976) [De, en, fr] [H. Maurer & Söhne Rauch- & Wärmetech. GmbH & Co. KG, D-7752 Insel Reichenau, Bodensee, Federal Republic of Germany]

After a brief discussion of problems with conventional smoking systems (excessive wt. loss, waste gas treatment, process control problems, 3,4-benzpyrene formation, etc.), the Maurer 'integral technology' smoking system is described. Smoking takes place in a sealed chamber, the smoke being recirculated. Careful regulation of air supply permits control of combustion temp. and hence of benzpyrene formation. Only 1-2 m^3/h of exhaust gas are produced (vs. $\leqslant 500$ m^3/h for conventional smoking); this may be treated in an electrical oxidation unit. Temp. and RH can be controlled continuously during smoking. AJDW

29

Chemical composition and application of smoke flavour. [Lecture]
Olsen, C. Z.
Proceedings of the European Meeting of Meat Research Workers No. 22, F7:1-F7:10 (1976) [En, fr, de, ru] [P. Broste Manufacturing A/S, Copenhagen, Denmark]

The composition and characteristics of liquid smoke preparations are discussed, with special reference to the product 'Scansmoke', which consists mainly of phenols and other compounds dissociated at pH 11-13.5. Aspects considered include: the composition of Scansmoke and other available liquid smoke preparations; manufacture; toxicology; analytical control; the relationship of composition to organoleptic properties; the availability of emulsified, salt-based and oil-based Scansmoke preparations; use in meat products, fish products, etc.; and the bactericidal and antioxidant activity of Scansmoke. [See FSTA (1977) 9 6S988.] AJDW

30

Identification of phenolic compounds in a Polish smoke flavour extract. [Lecture]
Borys, A.; Obiedzinski, M.; Olkiewicz, M.
Proceedings of the European Meeting of Meat Research Workers No. 22, F8:1-F8:7 (1976) [12 ref. En, fr, de, ru] [Meat & Fat Res. Inst., Warsaw, Poland]

A Polish smoke flavour extract (for use in meat products, etc.) was analysed, to identify its phenolic constituents. All phenols liberated from an alkaline millieu at pH 11 were extracted with diethyl ether and analysed by means of combined GLC-MS. Best separation conditions were obtained when using PTGC with Cromosorb W-DMSS glass columns, coated with XE-60 or OV-225 stationary phases. The analyses were run on a Du Pont model No. 21-492 mass spectrometer equipped with Varian model No. 2700 gas chromatograph and a data system. Based on the obtained analytical results, 39 phenolic and 4 non-phenolic compounds were identified. The identification was based on the respective mass spectra and retention volumes, which were compared with data gathered for standard substances and/or with data published elsewhere. [See FSTA (1977) 9 6S988.] AS

31

[Smoking techniques in the processing of meat and meat products.] Räuchertechnik in der Weiterverarbeitung von Fleisch und Fleischwaren.
Lange, W. G. K.
Schlachten und Vermarkten 76 (10) 336-343 (1976) [De, en, fr] [Im Ginsterbusch 7, 2000 Hamburg 61, Federal Republic of Germany]

Smoking of sausages and other meat products is discussed with reference to: smoking processes (cold-, moist-, warm-, hot- and electrostatic-smoking); the design and operation of combined hot-smoking and cooking systems (used for cooked sausages, etc.) and climatized smoking systems (used for raw sausages, etc.); ventilation systems for smoking units (with or without air recirculation); and processing conditions (smoking time, temp., RH, ventilation, etc.) for smoking of numerous types and diam. of sausages. AJDW

32

[Means of restricting emissions from plants for smoked foods.] Möglichkeiten zur Beschränkung der Emissionen von Anlagen zum Räuchern von Lebensmitteln.
Huch, R.
Wasser, Luft und Betrieb 20 (12) 669-673 (1976) [11 ref. De, en, fr] [Landesanstalt für Emmissions- & Bodennutzungsschutz, Essen, Federal Republic of Germany]

Methods of reducing the amounts of off-gas from smoking foods are discussed. New methods involving recycling, heating and cooling the emitted gases allowed the production of high-quality smoked meat products while reducing the off-gases to 1/100 of previous figures, e.g. to 13-28 m^3/h of gas containing $\leqslant 3700$ mg C/m^3 during 30-48 min of hot smoking or to 21 m^3/h containing 3000 mg C/m^3 during 117 min of cold smoking. RM

33

[Changes in nitrogenous substances during the manufacture and storage of dried fish products.]
Lapshin, I. I.; Shevchenko, M. G.
Rybnoe Khozyaistvo No. 10, 70-74 (1976) [Ru]

The effects of classical smoking and smoking with smoking liquid on changes of N substances in Notothenia rossi marmorata were studied during manufacture and storage of smoked products. Storage was at -4° to -6°C and 85% RH for 3 months. The indicator of changes was the content of total, non-protein, and amino and volatile basic N, and fractional composition of the proteins. The smoking liquid was not found to have adverse effects, the products sometimes having longer storage life than products smoked conventionally. STI

34

Tasmanian fish products undergo taste tests.
Anon.
Australian Fisheries 35 (12) 23 (1976) [En]

Results of taste tests conducted by CSIRO's Tasmanian Food Research Unit on the acceptability of locally-produced smoked eel, fish sausages and fish fingers are briefly reported. Fish fingers made from morwong (Nemadactylus macropterus) or redfish (Centroberyx affinis) were liked 'very much' by 23% and 30% respectively and liked at least 'slightly' by the majority of tasters. Smoked eel was rated 'very acceptable' by 44% and 'acceptable' by 53%. Spiced highly-smoked fish sausages prepared from ocean perch (Helicolenus papillosus) were reported to be delicious in small pieces as a cocktail snack, but comparison with meat sausage is unrealistic and categorized responses were variable. AL

35

The effect of water soaking, brining and cooking procedure on tenderness of broilers.
Oblinger, J. L.; Janky, D. M.; Koburger, J. A.
Poultry Science **55** (4) 1494-1497 (1976) [3 ref. En] [Inst. of Food & Agric. Sci., Univ. of Florida, Gainesville, Florida 32611, USA]

Experiments were conducted to determine the effects of salt brining time, water soaking, and cooking procedures on the tenderness of broilers. In all experiments there were no significant differences in shear values of meat from birds that were either smoked or oven-roasted. Meat from birds that were soaked in salt brine 16 or 32 h before either smoking or oven-roasting had significantly lower shear force values than meat from unbrined birds. There were no significant differences in shear values between light and dark meat from birds brined for either 16 or 32 h while shear values for light meat were significantly higher than for dark meat from unbrined birds. When broilers were either unbrined or soaked for 32 h in brine or tap water, the meat from water soaked birds had numerically higher shear force values than meat from unbrined birds. Meat from both water soaked and unbrined birds had significantly higher shear force values than meat from brined birds. Microbiological examination of broilers after smoking showed low levels of total aerobes and an absence of coliforms. AS

36

[The required accuracy of humidity control in climatized smoking installations.] Anforderungen an die Genauigkeit der Feuchteregelung bei Klimarauch-Anlagen.
Schuldt, P.
Fleischerei **27** (6) 15, 16, I (1976) [De, en, fr] [ALPAS-Schuldt & Kohn, Grossenstrasse 11, D-28 Bremen, Federal Republic of Germany]

Control of RH in smoking installations for dry sausage, etc. is discussed, with reference to: basic principles of psychrometric measurement of RH (using wet and dry bulb thermometers); other RH measurement methods (hair hygrometers, LiCl systems); the required accuracy (e.g. psychrometric measurement to ±0.2°C for a tolerance of ±2% RH); control on the basis of absolute values (with independent regulation of dry- and wet bulb temp.); the temp. difference method for RH control (on the basis of automatic transformation of wet, and dry-bulb temp. readings into a temp. difference value); and advantages of the temp. difference method (elimination of calculations, less susceptibility to error as a result of malfunction of the refrigeration plant, and greater accuracy). AJDW

37

[Smoking and heat treatment of Brühwurst sausages, with reference to minimization of pollution of the environment.] Rauch- und Wärmeanwendung bei Brühwurst unter Berücksichtigung umweltfreundlicher Technologien.
Lange, W. G. K.
Fleischerei **27** (7) 34-36, 38, V (1976) [De, en, fr]

Purification of waste gases from smoking plants is briefly discussed, with reference to: compounds present in smoke; saturation concn. of smoke constituents in air; presence and concn. of 3,4-benzpyrene in smoke and waste gases from smokehouses; and processes for treatment of waste gases (by condensation, absorption, adsorption, Cl_2 treatment, electrostatic or mechanical filters, cyclone systems, centrifugation, thermal combustion, or catalytic combustion). Recommended systems include thermal or catalytic combustion, and a multistage process based on condensation with simultaneous absorption, followed by mechanical separation of fine particles and final activated C adsorption treatment. AJDW

38

[Incidence of salmonellae in pork products.]
Bandy, P.; Akoshegyi, I.
Magyar Allatorvosok Lapja 32[?31] (6) 363-367 (1976) [19 ref. Hu, ru, en, de]

During the 39 months from the beginning of 1972 to March 1975, 247 Salmonella strains were isolated from 8446 samples taken from pig slaughterhouses and processing plants; main strains were S. cholerae suis (65 samples), S. typhimurium (63), S. reading (33), S. anatum (30), S. panama (20) and S. london (20). A further 58 strains, primarily S. reading (19 samples) and S. panama (11), were isolated from 2943 samples of faeces. Cold smoking is recommended for processing the meat in view of proliferation of the organism under warm conditions. A significant improvement (60%) in the detection of salmonella in uncooked smoked sausages and their raw materials was achieved when 0.5 or 0.1 ml (/5 or 10 ml, respectively) of the first, incubated culture was subinoculated; or, in the case of Proteus organisms, when solid Sterogen medium was used. HBr

39

[Contents of nitrous gases in smoke used in food processing.]
Kann, Yu. M.[Kann, J.]; Tauts, O. V.; Kalve, R.

E.; Pink, S. Yu.
Tallinna Poluetehnilise Instituudi Toimetised No. 383, 51-56 (1975) [9 ref. Ru, en]

Smoke was produced in (i) a laboratory friction generator (described and diagrammatically illustrated) or (ii) industrial generators or (iii) an open fire, and contents of NO_2 and NO were determined by the method of Saltzmann [Analytical Chemistry (1954) **26** (5) 1949] after removal of smoke impurities. NO contents were 0.8 µg/l. in (i), 7.6-16.7 µg/l. in the smoking zone in (ii) and $(NO + NO_2)$ 26 µg/l. in (iii). For food smoking, (i) type generators or liquid smoke preparations are recommended. SKK

40

[Method for smokeless curing of processed cheese.]
Berzhinskas, G. G.; Ignatavichene, R. B.; Sabalyauskaite, B. D. **Union of Soviet Socialist Republics,** Proektno-konstruktorskoe Byuro Ministerstva Myasnoi i Molochnoi Promyshlennosti Litovskoi SSR
USSR Patent 544 415 (1977) [Ru]

Vapourized liquid smoke is aprayed onto the surface of the cheese and the cheese is subsequently held in a suspension of the smoke. To reduce usage of smoke preparation and to accelerate the process, 1/5 of the preparation is introduced into the cheese at the end of the melting stage, and the total use of the preparation is 1.0-1.1% of cheese wt. W&Co

41

Flavour technology aspects of the utilisation of minced fish. (In 'The production and utilization of mechanically recovered fish flesh' [see FSTA (1977) 9 8R410].) [Lecture]
Pannell, R. J. H.
pp. 96-100 (1976) [En] [White Stevenson Ltd., Reigate, Surrey, UK]

Applications of flavour technology in manufacture of products from minced fish are discussed; products considered include pastes, spreads, fish cakes, fish fingers, imitation scampi, smoked fish bites, cod and parsley pie, cod and prawn flan, and burger-type products made from minced coley. Recipes are given for many of these products. A new process for manufacture of kippers and other smoked fish by means of a liquid smoke extract is briefly described. AJDW

42

Modeling and experimental analysis of moisture and heat transport in meat emulsion products during smokehouse thermal processing.
Agrawal, Y. C.
Dissertation Abstracts International, B 37 (5) 2388: Order No. 76-24546 (1976) [En] [Ohio State Univ., 190 North Oval Drive, Columbus, Ohio 43210, USA]

Models of simultaneous mass and heat transport were developed and simulated on a digital computer. Application of the models to smokehouse thermal processing of frankfurters was experimentally investigated at various processing temp., and moisture diffusivity in frankfurters was determined. Experimental techniques were developed for establishing the product and process parameters to be used in the models, the parameters being thermal conductivity, thermal diffusivity, equilibrium moisture content, and heat and mass transfer coeff. Moisture diffusivity in frankfurters, and in meat emulsions, was found to vary with temp. in accordance with the Arrhenius relationship. Moisture transport in meat emulsions was governed by Fickian diffusion under a moisture concn. gradient at emulsion temp. of at least $\leqslant$129.2°F; at higher temp. Fickian diffusion alone did not govern the intrinsic moisture transport characteristics of meat emulsion and was accompanied by some other mechanism acting simultaneously. JA

43

[Method of preparing cooked meat with a smoked taste.] Verfahren zur Herstellung nach Räucherrauch schmeckendem wärmegegarten Fleisch in der Art des geselchten Fleisches.
Henning, W.
German Federal Republic Patent Application 2 525 997 (1976) [De]

100 kg meat or poultry are immersed in 100 kg of a solution (containing 4-5% NaCl, sugar caramel powder and, optionally, a nitrite-containing curing additive) at 2-5°C for 24-48 h. The meat is then preferably vacuum-packed, pasteurized or autoclaved, or may have been cooked in its own juice prior to packing. Meat prepared in this manner tastes like conventionally smoked meat, but loses less wt. and is more juicy. It is also free of carcinogenic substances, specifically benzpyrene, found on the surface of conventionally smoked meat. W&Co

44

Methods of analysis of fats and fatty oils. Section 1.8. Determination of smoke point.
United Kingdom, British Standards Institution
British Standard **BS 684:Section 1.8**, 4pp. ISBN 0-580-09045-0 (1976) [En] Price £1.20 [2 Park Street, London W1A 2BS, UK]

Liquid or melted fat is heated under specified conditions, rapidly to within about 40°C of the smoke point then at a rate of 5-6°C/min, and the temp. at which smoke is evolved is noted. [See FSTA (1977) 9 8U470 for **BS 684:Introduction.**] AL

45

[Results of international cooperative check on the accuracy of quantitative determination of polycyclic hydrocarbons in foods by means of quasilinear spectra.]
Alekperov, I. I.; Ruvinskaya, S. E.; Panov, V. N.
Gigiena i Sanitariya No. 5, 63-66 (1977) [4 ref. Ru] [Nauchno-issled. Inst. Onkologii im. Prof. N. N. Petrova Min. Zdravookhraneniya SSSR, Leningrad, USSR]

In 1970, the Union of Pure & Applied Chemists and the Association of Official Analytical Chemists organized an international interlaboratory trial to evaluate the multistage method for detn. of polycyclic aromatic hydrocarbons in smoked foods developed by Howard et al.[see Journal of the Association of Official Analytic Chemists (1966) **49** 595-611 and (1968) **51**, 122-129]. Samples of smoked ham were used in the tests; mean recoveries in the tests of 3,4-benzopyrene, 1,2-benzopyrene, 1,2-benzanthracene and 1,12-benzoperylene were 71.5, 74.5, 86.6 and 81.0%, respectevely, and mean scatter of results was 12.7, 12.35, 9.01 and 9.37%, respectevely. A simplified TLC/UV flouroscence method, developed by the authors, was tested on the same samples; mean recoveries were 95, 111, 97 and 91%, respectevely, and mean scatter of results was 6, 17, 5 and 5%, respectevely. It is considered that the simplified method is superior to the internationally recommended method for all the compounds studied, except 1,2-benzopyrene. HBr

46

[Effect of various technological processes on the content of B group vitamins in fish preserves.]
Wituszynska, B.
Bromatologia i Chemia Toksykologiczna 9 (4) 467-477 (1976) [15 ref. Pl, en, ru] [Inst. Chem. i Anal. Akad. Med., Gdansk, Poland]

Riboflavin, nicotinic acid, pantothenic acid and vitamin B_6 contents of the raw material were determined at successive stages in the production of 6 different fish preserves: 'Herring Gdansk style', sprats in oil or tomatoes or with fruit and vegetables, and mackerel and tuna salads. Detn. were made after; treating the original raw material with vinegar; steaming; smoke-curing; and in the final product before and after sterilization. The preparatory stages caused an approx. 50% loss of the vitamins, while sterilization caused a further 10-30% loss. AS

47

[Smoking of fish.] Obrabotka ryby kopcheniem. [Book]
Khvan, E. A.
112pp. (1976) [22 ref. Ru] Moscow, USSR; Pishchevaya Promyshlennost'. Price 0.31r

Problems related to fish product quality improvement and extension of smoked fish products available are dealt with. The book includes the following chapters: Smoking as a method for improving the commercial properties of fish (pp. 5-42); Smoked fish quality and factors affecting it (pp. 42-63); Smoking equipment (pp. 63-91); and New kinds of fish smoking process (pp. 91-112). STI

48

[Analysis of a commercial smoke preparation. IV. Separation and identification of some components significantly influencing the organoleptic and preserving properties of the preparation.]
Radecki, A.; Grzybowski, J.; Halkiewicz, J.; Lamparczyk, H.; Bednarek, P.; Boltrukiewicz, J.; Rapicki, W.
Bromatologia i Chemia Toksykologiczna 9 (4) 461-466 (1976) [7 ref. Pl, en, ru] [Zaklad Chem. Fizyeznej, Akad. Med., Gdansk, Poland]

Preparative gas chromatographic analysis of a commercial smoke preparation revealed the presence of 2 compounds with significant organoleptic and preserving properties. These compounds were subjected to additional purification on columns with different polarity. Results of NMR, IR and UV spectral analysis showed the 2 compounds to have structures similar to those of 2-hydroxy-3-methylcyclopenten-1-one and 4-allyl-2,6-dimethoxyphenol. [See FSTA (1977) 9 5R265 for part III.] AS

49

[A weekly programme for a meat smoking and cooking plant.] Wochenprogramm für eine kombinierte Rauch- und Kochanlage.
Resch, W.
Fleischerei 27 (12) 25-26, VI (1976) [De, en, fr] [Schwalbenweg 48, D-6000 Frankfurt 56, Federal Republic of Germany]

Use of combined smoking/cooking units in the meat industry is briefly discussed, with reference to their characteristics and applications. A 7-day programme for max. efficiency of utilization of a smoking/cooking unit is described; operations considered include ripening of dry sausages, cooking of sausage ingredients and meat products, and hot-, warm- and cold-smoking of various types of sausages and other meat products. AJDW

50

[Problems with cleaning of smoking chambers.] Probleme mit der Räucherkammereinigung.
Anon.
Fleischerei 27 (11) 54-55 (1976) [De]

51

[Analysis of smoke and smoked foods.] Analyse von Räucherrauch und geräucherten Lebensmitteln. [Lecture]
Hamm, R.
Fleischwirtschaft 57 (1) 92-96, 99 (1977) [117 ref. De, en, fr] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

After a survey of the compounds present in smoke and smoked foods, the effects of smoke production temp. and smoking technique on the quantitative composition of polycyclic aromatic hydrocarbons (PAH) and phenolic compounds produced, their methods of isolation and detn., a new method for isolation and purification of PAH, and methods for isolation and detn. of phenols are discussed. For both groups of compounds, greatly simplified methods have been developed by Potthast [see FSTA (1975) 7 6S773]. These methods simplify the extraction procedure prior to GLC or MS-GLC detn. Routine quality control demands the establishment of a few key compounds (to be determined by further research). RM

52

[Course of lard autoxidation in the presence of liquid smoke.]
Chomiak, D.; Goryn, A.
Roczniki Instytutu Przemyslu Miesnego i Tluszczowego 13, 93-103 (1976) [15 ref. Pl, ru, en] [Inst. Przemyslu Miesnego i Tluszczowego, Warsaw, Poland]

Each of 5 liquid smoke preparations produced by the Chemists' Co-operative in Gdansk (Poland) was dissolved at 0.005, 0.02, 0.2, 2 or 10% in 2 samples each of lard from 3 quality categories (I, II and E). Lard stability was assessed by peroxide detn. in room temp. and accelerated tests, and phenol fraction composition of the liquid smoke preparations was determined by GLC. The results are tabulated or graphically presented in detail. The compositions (proportions of different peaks are presented) and antioxidant activities of the 5 liquid smoke preparations were similar. Their optimal antioxidant activity was in the 0.2-2% concn. range; at 1%, they ensured stability of lard solution, at room temp., for ⩾ 1.5 yr. Liquid smoke at 10% proved pro-oxidative. SKK

53

[Stability of aqueous emulsions of liquid smoke preparation.]
Chomiak, D.; Olkiewicz, M.
Roczniki Instytutu Przemyslu Miesnego i Tluszczowego 13, 105-112 (1976) [5 ref. Pl, ru, en] [Inst. Przemyslu Miesnego i Tluszczowego, Warsaw, Poland]

2 and 10% solutions of liquid smoke in lard [see preceding abstr.] are used in Poland commercially for addition to sausage mixes. They are easy to dose, stable and conveniently transported, but may cause taste defects in the sausages through uneven distribution in the mix. Tests were therefore carried out with aqueous emulsions which would be free from this fault and could also be used in injection curing of hams. Aqueous emulsions of liquid smoke were prepared using different proportions of food gelatin as emulsifying agent. Emulsion stability and colour were measured during storage for ⩽ 200 days. It is concluded from tabulated results that emulsions containing 1% liquid smoke and 1% gelatin were the most satisfactory, and were also reasonably stable when mixed with curing brine. SKK

54

[Gas chromatographic study of the phenolic composition of canned 'sprats in oil'.]
Kolonistova, I. V.; Pechatina, V. I.; Plorinya, A. P.; Kirshbaum, I. Z.
Fischerei-Forschung 14 (1) 89-92 (1976) [21 ref. Ru, de] [Baltiiskii Nauchno-issled. Inst. Rybnogo Khozyaistva, Riga, USSR]

GLC chromatograms of phenolic compounds of canned sprats in oil from 3 Baltic fish factories (including 2 presented in the preceding abstr.) and of the phenolic fraction of smoke condensate from the smoke generator of 1 of the factories are presented, and proportions of 18 phenolic compounds in the 3 brands of sprats and in the smoke condensate are tabulated. The role of the different compounds in the taste and aroma of the canned products is discussed. SKK

55

[Applications of modern universal cooking chambers for smoking and cooking.]
Einsatzmöglichkeiten moderner Universal-Garmachekammern zum Räuchern, Kochen und Garen.
Reich, W.
Fleischerei 28 (3) 25-26, 28, 31 (1977) [De] [Reich KG, D-7064 Remshalden-Hebsack, Postfach 1304, Federal Republic of Germany]

The design and operation of modern combined smoking/cooking units for meat products, etc. are discussed, with special reference to automatic control, smoke generation, and prevention of pollution of the environment. Applications in the meat industry are discussed, including: cold smoking; pre-reddening or 'sweating'; drying (with or without smoking); hot smoking; boiling; baking; roasting; and cooking with hot air. AJDW

56

[Treatment of meat products with smoking preparation "VAKhTOL".]
Yavors'kii, M. I.; Berezenko, G. M.; Gorodis'ka, V. D.; Vorobiova, N. M.
Kharchova Promislovist' (Naukovo-virobnichii Zbirnik) No. 3, 41-43 (1976) [6 ref. Uk] [Ukrains'kiii Naukovo dislidnii Inst. M'yasnoii i Molochnoii Promislovosti, USSR]

This new smoke preparation (a distilled wood pyrolysate of pH 2.34 and sp. gr. 1.01-1.02, characterized by high proportions of carboxylic acids and phenols) was used for treatment of various types of fish and sausages. It was applied in a mixture with steam and hot air. Comparative studies on shelf-life, organoleptic properties and microbiological quality showed that products treated with this smoke preparation were of at least equal quality to those smoked by conventional methods. STI

57

[Minimization of the 3,4-benzopyrene content of smoked fish products by modification of the smoking process.] Verminderung des 3,4-Benzopyren-Gehaltes in geräucherten Fischerzeugnissen durch Beeinflussung der Räucherung.
Steinig, J.; Schreiber, W.
Informationen für die Fischwirtschaft 24 (3/4) 126-133 (1977) [4 ref. De] [Inst. für Biochem. & Tech., Hamburg, Federal Republic of Germany]

The potential for minimization of the concn. of 3,4-benzopyrene (3,4-BP) in or on fish smoked in 'Altona'-type smoking units was studied. 6 types of metal filters (perforated sheets, steel wool or expanded metal) and 6 types of glass fibre filters were tested. The trials were conducted with herrings and 'Schillerlocken' (strips of belly wall from dogfish). Graphs are given showing 3,4-BP concn. in the smoked product. The results show that use of smoke filters significantly reduced the concn. of 3,4-BP in the inner layers of both fish types, but not in the skin of the herrings and the outer layers of the Schillerlocken. Glass-fibre filters gave better results than metal filters; however, metal filters could be cleaned and re-used, whereas glass fibre filters cannot be re-used. Wood consumption is increased by the use of smoke filters; drying times and product quality are not significantly affected. AJDW

58

[Effect of smoking technology on the contamination of smoked fish with 3,4-benzopyrene.]
Lenges, J.; Vo Thi, N. B.; Declerck, D.
Revue des Fermentations et des Industries Alimentaires 31 (4) 97-101 (1976) [9 ref. Fr, nl] [Service de Tech. Alimentaire, IIF-IMC, CERTA, 1070 Brussels, Belgium]

The mean 3,4-benzopyrene content of herrings smoked in an industrial installation (Afos Smook Producers, Torry Research Institute, Aberdeen, Scotland) was 2.59 parts/billion (ppb) at high temp. vs. 0.30 ppb at low temp. (4 h at 28° C); the mean 3,4-benzopyrene content of mackerels smoked at high temp. was 1.04 ppb. In further studies the 3,4-benzopyrene content of herrings increased from 0.09 to 0.14 ppb during the 1st heating period of 45 min at 45° C, to 0.18 ppb during the 2nd period of 45 min at 55° C and to 0.37 ppb after the 3rd period of heating for 75 min at 70-80° C. No correlation between 3,4-benzopyrene and total phenol contents was found. Since 75% of the 3,4-benzopyrene contamination occurred during smoking at high temp., it is recommended that smoke should be omitted during the 3rd drying period. If insufficient colour is obtained, an initial period of smoking at 25-30° C is suggested. MEG

59

[Chemical compositions of smoke flavour.]
Ishiwata, H.; Watanabe, H.; Watanabe, M.; Hayashi, T.; Hara, Y.; Kato, S.; Tanimura, A.
Bulletin of the National Institute of Hygienic Sciences [Eisei Shikenjo Hokoku] 94, 112-116 (1976) [6 ref. Ja, en] [Nat. Inst. of Hygienic Sci., 18-1, Kamiyoga-1-chome, Setagaya-ku, Tokyo, 158 Japan]

15 samples of commercial smoke flavour were examined. Total carbonyl compounds were in the range 22.1-50.1 mg hydrazone/ml and total phenolics <0.001-1.06 mg/ml, (excluding non-food use samples). Figures are given for methanol, formaldehyde and formic acid contents, and some gas chromatograms are illustrated, showing relative quantities of acetic acid, propionic acid, furfural, methylfurfural, guaiacol, phenol, O-cresol, m- and p-cresol, 3,5-xylenol, 2,6-dimethoxyphenol and 2,6-dimethoxy-4-methylphenol. JRR

60

Method for baking food products.
Johansson, L. A. T.; Pers, N. G. (Tipe Revent AB)
United States Patent 4 029 463 (1977) [En]

Food products are baked whilst supported on superimposed horizontal racks in a chamber, the flow of air which can be varied cyclically during the baking process. This method of baking may be applied to reconstitute frozen foods, to smoke-cure foods or to bake bread. GL

61

The qualitative and quantitative measurement of peat smoke on distiller's malt.
Bathgate, G. N.; Taylor, A. G.
Journal of the Institute of Brewing 83 (3) 163-168 (1977) [16 ref. En] [Moray Firth Maltings Ltd., Longman Road, Inverness, UK]

In the course of developing a novel peating process it became apparent that the present methods for determining the intensity of peat smoke on distiller's malt are inadequate. While the colorimetric test for peat phenols is fairly accurate at low levels, it can give misleading results with highly peated malts. Furthermore, the 4-aminophenazone reagent used in this test is not sensitive to some of the major phenol constituents of peat smoke. New qualitative gas chromatographic techniques, which monitor a wider spectrum of peat smoke constituents, are now presented together with some suggested improvements to the existing quantitative colorometric analysis, in particular the use of small malt samples (10 g), small vol. of ether for re-extraction (25 ml) and use of ≥2 extractions from the ether with aqueous ammonia. AS

62

[Product examination of coal-tar dyes. XV. Results of the product examination of coal-tar dyes and coal-tar aluminium lakes from April 1975 to March 1976.]

Iwaida, M.; Nakamura, K.; Yamaji, A.; Suzuki, H.; Matsumoto, Y.; Nishikawa, M.; Kaneda, Y.
Bulletin of the National Institute of Hygienic Sciences [Eisei Shikenjo Hokoku] **94**, 124-126 (1976) [4 ref. Ja, en] [Nat. Inst. of Hygienic Sci., Tokyo, Japan]

387 samples of dyes were inspected in this period, (decreases of 5.6% and 46.7% compared with 1974-1975 and 1973-1974, respectively). Prohibition of Food Red No. 2 (amaranth) in the USA affected production in Japan; no amaranth was sent for inspection after Jan. 1976. A total of 40 food coal-tar dye lakes were inspected; 67.5% consisted of lakes of Food Yellow No. 4 (tartrazine) and No. 5 (sunset yellow FCF). 3 samples of Food Yellow No. 5 and 1 sample of Food Red No. 102 were disqualified for containing excess chloride plus sulphate. No lake was disqualified in this period. [From En summ.] [See FSTA (1976) 8 10T490 for part XIV.] JRR

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H. BROOKES

ASSISTANT EDITOR

1

Heat-treatment.
Muvero BV
British Patent 1 476 119 (1977) [En]

Heat treating apparatus, particularly for smoking foods, is designed to provide uniform flow of the treating fluid through the smoking chamber. IFT

2

[Preparation and transport of smoke-air mixture for cold smoking of fish.]
Gudovich, A. V.; Braslavskii, S. Yu.; Kozyrev, V. V.; Yashin, V. V.; Bunin, D. Kh.; Popov, M. V.
Rybnoe Khozyaistvo No. 6, 64-66 (1977) [Ru]
[Giprorybprom, USSR]

A new method for the preparation and transport of smoke-air mixture is discussed. For smoke formation re-circulated smoke, which comes into the smoke generator without addition of external air is used. Thus smoke concn. is enhanced, waste smoke is reduced and treatment of smoke prior to emission into the atmosphere is facilitated. Owing to the lower O_2 content the smoke is enriched with aldehydes and acids, less moisture is formed, as well as soluble and insoluble resins. Organic acids in the re-circulated smoke act as catalysts to promote the hydrolytic reactions occurring during decomposition of the wood. The smoke-air mixture is produced by blending the smoke and conditioned air in the ejector. The proposed technique makes it possible to modify moisture, temp., concn. and flow speed of the smoke-air mixture, as required for the cold smoking process. STI

3

[Method of preparing cured raw or cooked meat products having a smoked taste.] Verfahren zur Herstellung rauchig schmeckender rohgepökelter oder wärmegegarter Fleischwaren.
Henning, W.
German Federal Republic Patent Application 2 528 740 (1977) [De]

The smoky taste characteristic of cured meat is given to the meat not by exposing it to the actual smoke but by spraying it with a cold or hot curing solution, which is made by smoking water-soluble food products, e.g. salt, sugar or caramel, and dissolving them preferably in acetic acid. The amount of benzpyrene (which is thought to be carcinogenic) entering the meat is far below the max. recommended dose, when using this method. W&Co

4

[The chemical composition and bacteriology of some dried meat products.] Zur chemischen Zusammensetzung und Mikrobiologie einiger getrockneter Fleischprodukte.
Sinell, H. J.; Hentschel, S.
Fleischwirtschaft 57 (7) 1317-1320 (1977) [15 ref. De, en, fr] [Inst. für Lebensmittelhygiene, Freie Univ., Bitterstrasse 8-12, 1000 Berlin (West) 33]

13 dried meat products, including 8 samples of smoked beef, 2 of Bündner-type smoked beef (Bündnerfleisch) and 3 of smoked game, were examined. Tabulated results showed moisture contents of 43.0 (Bündnerfleisch) to 61.9% (smoked beef), fat contents of 1-5% (except for 10.6% in 1 sample of smoked beef) with mean 3.67%, and crude protein 25.3-45.9% with mean 31.28%. Bacteriological examination revealed a predominant flora of lactobacilli (8×10^2-6×10^7/g) and micrococci (2×10^2-6×10^6/g), no detectable Staphylococcus aureus, no Gram-negative organisms, no sulphite-reducing anaerobes or salmonellae, occasional streptococci of serological group D, and occasional yeasts (mainly on the surface). There was little sign of a relationship between analytical/chemical and bacteriological data. There was a trend for increased total count and reduced count of micrococci with rising moisture content, suggesting that the growth of micrococci was not affected at the water activity of the material studied. The results confirm the findings of Hess et al., [FSTA (1977) 9 1S137, 2S269] and show the microflora typical for dried smoked meats. RM

5

[Method for heat treatment of sausages.]
Berezenko, A. M.; Gorodiskaya, V. D.; Yavorskii, M. I. (**Union of Soviet Socialist Republics,** Ukrainskii Nauchno-issledovatelskii Institut Myasnoi i Molochnoi Promyshlennosti)
USSR Patent 556 775 (1977) [Ru]

Semi-smoked sausages are produced by pre-drying, heat treatment, cooking, drying and application of a liquid smoke by spraying. To improve organoleptic properties by uniform distribution of the liquid, pre-drying is continued for 10-30 min, and the liquid is applied in 2 stages, during heat-treatment at 90-100° C, and before drying at 70-80° C. The liquid is applied without access of fresh air. W&Co

6

[Investigation of smoke components in smoked fish.]
Ionas, G. P.; Alsuf'ev, V. A.; Kondakova, L. V.; Stepanova, M. I.; Shaposhnikov, Yu. K.
Rybnoe Khozyaistvo No. 5, 69-71 (1977) [Ru]
[VNIRO, USSR]

Qualitative and quantitative aspects of absorption of smoke components by mackerel (cold smoked at 22-30° C, using various types of wood) were studied. Phenols, organic acids and amines were determined in fish (with and without skin). Concn. of acids and phenols varied more in fish smoked by a 'domestic' process than in fish processed with generator-produced smoke. The variations of phenol and acid concn. in the former are reflected in the superior organoleptic properties. STI

7

[Preservation by smoking of some Guyanese lagoon fish (Siluridae).] (In 'Proceedings of the Conference on the handling, processing and marketing of tropical fish' [see FSTA (1978) 10 2R48].) [Lecture]
Durand, H.
pp. 327-329 (1977) [Fr, en, es] [Inst. Sci. & Tech. des Peches Maritimes, Rue de l'Ile d'Yeu, BP 1049, 44037 Nantes Cedex, France]

Experiments were carried out on 2 spp. of marine Siluridae (Arius luniscutis and A. albicans) to investigate the preparation of salted and smoked fillets. These fish are popular in the area and are smoked traditionally but an improved product is required. The fish were filleted, lightly brined and hot smoked (40 min at 35° C, 40 min at 70° C and 50 min at 85° C) in a mechanical kiln. The yield after smoking was estimated and the products were vacuum wrapped and stored at 2-4° C. Quality changes were determined during storage by organoleptic and chemical means and the fillets were found to have an acceptable shelf life of 3 wk. The possibility of establishing a small industry based upon this new product is considered. AS

8

Village level processing in Zambia and the potential for improvement. (In 'Proceedings of the Conference on the handling, processing and marketing of tropical fish' [see FSTA (1978) 10 2R48].) [Lecture]
Clucas, I. J.; Chamasonde, S.
pp. 473-477 (1977) [6 ref. En, fr, es] [Tropical Products Inst., 56/62 Gray's Inn Road, London WC1X 8LU, UK]

Present fish processing practices are reviewed with particular reference to the artisanal fisheries of Zambia, with descriptions given of drying, including 3 methods for processing cichlids (mainly Tilapia sp.), smoking, sun drying and dry salting. The constraints to rapid development are outlined and suggestions put forward for improving the situation by training programmes, supply of ice, provision of salt, and improved smoking equipment. AL

9

The mycoflora associated with dry salted tropical fish. (In 'Proceedings of the Conference on the handling, processing and marketing of tropical fish' [see FSTA (1978) 10 2R48].) [Lecture]
Phillips, S.; Wallbridge, A.
pp. 353-356 (1977) [11 ref. En, fr, es] [Tropical Products Inst., 56/62 Gray's Inn Road, London WC1X 8LU, UK]

Samples of tropical fish, dried, dried and salted, split dried, salted and smoked, were examined to determine the mycoflora associated with the fish after processing. The fungi isolated were Aspergillus amstelodami (Mangin) Thom and Church, Aspergillus ruber (Konig, Spieckermann, and Bremer) Thom and Church, Aspergillus flavus Link, Aspergillus niger van Tieghem, Aspergillus chevalieri (Mangin) Thom and Church, Aspergillus ochraceus Wilhelm, Wallemia sebi (Fr.) v. Arx, Penicillium spp., Acremonium sp. and Rhizopus sp. The in vitro sensitivity to propionic acid and sorbic acid of A. chevalieri, A. amstelodami, A. ochraceus and A. niger was determined. Results showed that the fungi were sensitive to both inhibitors. AS

10

[The possibility of using smoke concentrate in sausage manufacture.]
Stamenkovic, T.; Diviki, B.
Tehnologija Mesa 17 (12) 357-362 (1976) [42 ref. Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

The smoke concentrate Etol I.F. F. 8027 was tested with frankfurters and various sausages. The concentrate was added to the emulsion with salt as carrier (75%:25% salt/concentrate ratio). 1.5-3% of the concentrate was added, depending on the product type. The taste and smell of the products were organoleptically assessed 24 h after thermal processing. Organoleptic evaluation data for the experimented and control products are presented. Addition of Etol 8027 gave organoleptically better products than the control samples. Optimal doses for individual products are presented, along with other data appertaining to the application of smoke concentrates in sausages. STI

11

[Bactericidal activity of a Yugoslav smoke preparation.]
Oluski, A.; Zivanovic, R.
Tehnologija Mesa 17 (12) 374-375 (1976) [7 ref. Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

The effect of Etol-I.F.F. on bacteria and moulds was studied. Cultures of Bacillus subtilis, B. cereus, Sarcina subflava, Sarc. lutea, Staphylococcus aureus, Staph. epidermidis and Micrococcus flavus were inoculated on agar; the smoke concentrate was then added (0.5, 1 and 2%) and the plates were incubated at 37° C for 24 h. The smoke concentrate was found to have no bactericidal or bacteriostatic effect on the named bacteria. Also, it had no effect on moulds of the genera Aspergillus, Penicillium, Mucor, Alternaria, Ochraceus and Verticillium. STI

12

[The possibility of using smoke concentrates in canned meat.]
Trumic, Z.; Djordjevic, M.; Masic, N.
Tehnologija Mesa 17 (12) 355-357 (1976) [Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

Problems occur in using smoke concentrate in sterilized comminuted meat products (e.g. luncheon meat). A study was made of the effect of adding 0.1, 0.3, 0.6, 1.0 or 1.5% of smoke concentrate (Etol-8027) to the meat. It was shown that: adding 0.1-0.2% imparted a fuller, appealing flavour, with no effect on smell; 0.2-0.4% had little effect on smell and taste; 0.4-0.8% enhanced the taste and smell, making the properties of the product similar to those of smoked meat; and additions of >0.8% made the products similar to over-smoked meat as regards smell and taste. STI

13

[Application of smoke concentrate in the manufacture of dried cured meat products and bacon.]
Modic, P.; Milosevski, V.; Turubatic, L.; Aleksic, D.
Tehnologija Mesa 17 (12) 363-366 (1976) [Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

Smoked pork neck, smoked shoulder, smoked beef, beef, ham, etc. were treated with 0.5-1% (meat wt. basis). Etol-8027 smoke concentrate added to the brine, held for 5 days after brining and processed by the traditional method or without smoking. A comparison of the smoke concentrate products with control samples (i.e. traditional dried cured meat products with high organoleptic qualities) showed no detectable organoleptic differences between them. STI

14

[Smoke concentrate used in the manufacture of prepared meals.]
Petrovic, N.; Panin, J.; Maric, L.
Tehnologija Mesa 17 (12) 366-369 (1976) [Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

Studies on the use of smoke concentrate to impart a smoke flavour to bacon or sausage for use in prepared meals are discussed. Beans with Serbian sausage or with bacon containing the smoke concentrate Etol-8027 at a concn. of 0.5 or 1.0% by wt., were prepared. Organoleptic properties (taste, smell, colour and overall appeal) were evaluated. The results show that use of the smoke concentrate was successful, addition of 0.5% giving a satisfactory flavour. Advantages claimed include more rapid processing and reduced wt. losses. STI

15

[Technological and economic aspects of use of smoke concentrates in the meat industry.]
Modic, P.; Podgorsev, M.
Tehnologija Mesa 17 (12) 380-382 (1976) [Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

Advantages claimed for the 'Etol-I.F.F. 8027' smoke concentrate are discussed, including the following: freedom from carcinogenic constituents; good organoleptic properties; compatibility with all types of meat products (including canned products); improvement of the surface colour of dried smoked meat products; enhancement of the organoleptic properties of other flavourings; uniformity of the characteristics and intensity of the smoke flavour imparted to the product; reduction in processing time (by 20%); reduced capital costs; and improved product quality. STI

16

[Application of smoke and smoke concentrate in the meat processing industry.]
Trumic, Z.; Petrovic, N.
Tehnologija Mesa 17 (12) 340-343 (1976) [14 ref. Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

Smoking of meat and meat products is discussed, with reference to: types of smoke generators; automatic control of smoking conditions; electrostatic smoking; and liquid smoke concentrates. Advantages of use of liquid smoke concentrates in various products are discussed, including accurate control of smoke composition, elimination of undesirable constituents, potential for addition of flavourings, accelerated processing, and improved hygiene. STI

17

[Smoke concentrate used in the manufacture of poultry sausages.]
Nedeljkovic, L.; Isakov, M.; Bogojevic, M.
Tehnologija Mesa 17 (12) 372-374 (1976) [Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

Effects of addition of 0.5, 1.0 or 1.5% 'Etol' smoke concentrate on the quality of various types of poultry sausage emulsion were studied. Addition of the smoke concentrate was found to be advantageous. 0.5% Etol gave good results with sausages intended for roasting; 1.0% Etol gave good results in heat-processed sausages. Addition of >1.0% Etol adversely influenced quality. STI

18

[Some organoleptic properties of smoke concentrate and their effect on the organoleptic properties of meat products.]
Torubatovic, L.; Modic, P.
Tehnologija Mesa 17 (12) 377-380 (1976) [Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

The 4 batches of 'Etol 8027' smoke concentrate studied were found to be identical as regards concn., presence of active substances, and organoleptic properties. The effect of the concentrate colour on the colour of the meat products of any type was negligible. The smokey flavour and taste were governed by the mode of the thermal processing, and were more pronounced with pasteurized than sterilized products. If fat is eliminated from the product, the fat exhibits a strong smokey flavour, the taste approaching that of smoked bacon. STI

19

[Basic characteristics of manufacture of a smoke concentrate; the properties of this concentrate.]
Prihavec, D.; Polic, M.
Tehnologija Mesa 17 (12) 349-351 (1976) [14 ref. Sh, en] [Tovarna Arom in Etericnih olj 'Etol I.F.F.', Celje, Yugoslavia]

Manufacture of smoke concentrates from oak, beech or hickory woods or a combination of these woods is described; smoke of uniform composition may be produced, provided that the wood used is of uniform cellulose, hemicellulose, lignin and moisture content. The wood is pyrolysed by dry distillation, either with or without access of air. The smoke may be condensed fully or in fractions. Polycyclic hydrocarbons may be separated by fractionation, selective extraction, or washing with water. The condensed product is further purified physically, to remove tars. Salt is used as a carrier material for the concentrate. Data are given for the composition of 'Etol 8027' smoke concentrate; GLC analysis showed this preparation to be free from 3,4-benzpyrene, dibenzanthracene and 20-methylcolanthrene. STI

20

[The possibility for use of smoke concentrates in the manufacture of semi-preserved canned pork and veal.]

Modic, P.; Dimitrijevic, D.; Gobec, S.; Kuhar, J.
Tehnologija Mesa 17 (12) 352-355 (1976) [Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

Studies were conducted on flavouring of canned pork and veal products (especially ham and pork shoulder) with smoke concentrate. The smoke concentrate is mixed with brine before injection into the meat at levels of 0.5-0.6 and 0.4-0.5% smoke concentrate (meat wt. basis) in pork and in veal resp. Results show that use of these concn. of smoke concentrate is highly satisfactory with pasteurized products; with sterilized products, slightly higher concn. ($\leqslant$0.7%) are necessary. STI

21

[The chemistry of smoke and smoke concentrates; the effect and importance of individual components for the meat products.]

Polic, M.
Tehnologija Mesa 17 (12) 345-349 (1976) [27 ref. Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yoguslavia]

Constituents of wood smokes and smoke concentrates are discussed, and classified into desirable constituents (phenols, volatile acids and carbonyl compounds) which impart flavour, aroma and colour to the meat; and undesirable constituents (including carcinogenic hydrocarbons, e.g. 3,4-benzpyrene, naphthalene, anthracene and phenanthrene). Important phenols include pyrocatechol, pyrogallol, guaiacol, 4-methylguaiacol, eugenol and siringol; important carbonyl compounds include furfural, diacetyl, vanillin, formaldehyde and methylcyclopentenal. Flavour compounds may also be formed by reaction of phenols with amino acids in meat products. STI

22

[Smoke concentrate used in the manufacture of canned poultry meat.]

Isakov, M.; Nedeljkovic, L.; Bogojevic, M.
Tehnologija Mesa 17 (12) 370-372 (1976) [Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

The products studied were poultry meat paste with added bacon or chicken liver. 0.5, 1.0 and 1.5% 'Etol-8027' smoke concentrate was added to the emulsion during cutting. The pastes were filled into 150-g metal containers and sterilized at 118° C for 20-25 min. The results are promising: addition of 1.0% of the concentrate markedly improves the quality of the sterilized meat products studied. STI

23

Canning of smoked sardine.

Unnikrishnan Nair, T. S.; Balachandran, K. K.; Madhavan, P.
Fishery Technology 14 (1) 49-52 (1977) [8 ref. En] [Cent. Inst. of Fisheries Tech., Cochin-682 003, Kerala, India]

In the process for canning smoked fish, the dressed oil sardines (Sardinella longiceps) are immersed in cold brine, and smoked using coconut husk smoke. They are dried in hot air or cooked in steam to reduce the moisture content and subsequently canned in groundnut oil or tomato sauce. CFTRI

24

[The effect of smoke concentrate on the internal surface of tinplate containers.]

Simic, N.; Dordevic, G.
Tehnologija Mesa 17 (12) 376-377 (1976) [Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

Studies on effects of smoke concentrates on the inside surfaces of cans of the type used for canned meat products are described. No adverse effects were observed on cans with an interior coating of gold lacquer or varnish containing Al pigment. STI

25

Determination of optimum brine curing procedures for smoked chicken.

Stubblefield, J. D.; Hale, K. K., Jr.; Ware, G. O.
Journal of Food Science 42 (5) 1349-1352 (1977) [16 ref. En] [Dep. of Poultry Sci., Agric. Exp. Sta., Univ. of Georgia, Athens, Georgia 30602, USA]

Optimization of curing procedures for smoked chicken was studied using surface response methodology. Preferred NaCl levels of 4-5% in the cooked meat were achieved with several combinations of cure time and brine NaCl concn. One excellent combination was 10.5% NaCl and 24 h cure. Although data on sucrose did not give the optimum level, sucrose in the brine should be $\leqslant$20-30% of the NaCl level. $NaNO_3$ was not necessary for the short cure times of this study where $NaNO_2$ and ascorbic acid were used in the curing brine. A short equilibration period of 6-12 h after curing before cooking appeared adequate to allow sufficient dispersion of brine ingredients in the meat. IFT

26

[Smoking of meat and meat products.] Räuchern von Fleisch und Fleischerzeugnissen. [Review]
Polymenidis, A.
Fleischwirtschaft 57 (10) 1787-1788, 1790-1794, 1804, 1806-1807 (1977) [many ref. De, en, fr] [Tech. Univ. for Food Tech., K.A.T.E., Vassilis Olgas 44, Thessaloniki, Greece]

This review discusses the production and chemical composition of smoke, its antibacterial action, the physical and chemical processes during smoking of meat products, various smoking processes (cold, warm, hot, moist and electrostatic smoking, use of smoke condensates), and the smoking of meat and meat products in Greece. RM

27

[Meat preserves. Smoked pasteurized bacon in slices.]
Union of Soviet Socialist Republics, Gosudarstvennyi Komitet Standartov
Soviet Standard **GOST 9167-76,** 3pp. (1976) [Ru]

This standard applies to salted and smoked bacon slices from the belly of carcass halves, canned and pasteurized. The product shall contain 2.5-3.5% salt, $\leq$ 100 mg sodium nitrite/100 g, $\leq$ 100 mg Sn salts (in terms of Sn)/kg, and no Pb salts or foreign admixtures. The standard also covers packaging, transport (refrigerated vehicles at 0-5° C) and storage ($\leq$75% RH at 0-5° C; shelf life is 6 months). HBr

28

International symposium on advances in smoking of foods. [Conference proceedings]
International Union for Pure & Applied Chemistry, Applied Chemistry Division; International Union of Food Science & Technology; **Poland,** Polish Academy of Sciences
Pure and Applied Chemistry 49 (11) 1627-1702 (1977) [many ref. En]

Part of this issue of the journal contains plenary lectures presented at the International symposium on advances in smoking of foods, held at Warsaw, Poland, on 8-10 Sept. 1976. Papers include: Contribution of smoke compounds to sensory, bacteriostatic and antioxidative effects in smoked foods, by N. Barylko-Pikielna (pp. 1667-1671, 38 ref.); and Some facts and legislation concerning polycyclic aromatic hydrocarbons in smoked foods, by E. A. Walker (pp. 1673-1686, 35 ref.). A further 4 papers are abstracted separately and are in the FSTA author index under International Union for Pure & Applied Chemistry, Applied Chemistry Division [Foods Smoking Symposium]. AL

29

The phenomena of quality in the smoke curing process. [Lecture]
Tilgner, D. J.
Pure and Applied Chemistry 49 (11) 1629-1638 (1977) [59 ref. En]

Some advances in the smoking process over the past 20 yr are reviewed in general, with mention of particle technology, wholesomeness, polynuclear-free smoke, controlled smoke generation, surface colouring, flavour components, and commercial practice. [See FSTA (1978) 10 4E101.] AL

30

Physical and chemical processes involved in the production and application of smoke. [Lecture]
Rusz, J.; Miler, K. B. M.
Pure and Applied Chemistry 49 (11) 1639-1654 (1977) [68 ref. En] [Meat Res. Inst., Brno, Czechoslovakia]

Physical and chemical processes involved in the production of wood smoke and its application to foods are reviewed and discussed. Factors affecting the production of smoke and means for making it a more controllable process are discussed, as well as ways of estimating the concn. of individual compounds in the vapour phase. Conventional smoke may contain not only polynuclear hydrocarbons, but also be contaminated with nitroso compounds (e.g. nitrosamines). [See FSTA (1978) 10 4E101.] AL

31

Analysis of smoke and smoked foods. [Lecture]
Hamm, R.
Pure and Applied Chemistry 49 (11) 1655-1666 (1977) [117 ref. En] [Bundesanstalt für Fleischforschung, Kulmbach, Federal Republic of Germany]

After reviewing the chemical compounds present in wood smoke and smoked foods and the desirable and undesirable effects of these compounds, the influence of smoking technology on the composition and amount of polycyclic aromatic hydrocarbons (PAH) and phenolic compounds in smoke and smoked foods is described briefly. Procedures for the isolation and detn. of PAH, particularly in smoked meat products, and of phenols are discussed. [See FSTA (1978) 10 4E101.] AL

32

Novel concepts in technology and design of machinery for production and application of smoke in the food industry. [Lecture]
Hollenbeck, C. M.
Pure and Applied Chemistry 49 (11) 1687-1702 (1977) [En] [Red Arrow Products Co., Manitowoc, Wisconsin, USA]

Some novel concepts in the technology and design of machinery for production and application of smoke are discussed, taking into account the need for better control of smoke flavour and colour, concern for possible carcinogenesis from components in wood smoke, the need to decrease smoke effluent, and the need for better design and faster throughput in smoking systems. Examples described are the wider use of liquid smoke applied by drenching, atomizing or vapour regeneration, refinement of smoke by electrostatic filters to remove the particulate phase, development of closed system smoking chambers, and construction of continuous smoking tunnels. [See FSTA (1978) 10 4E101.] AL

33

[Analysis of polycyclic aromatic hydrocarbons in raw and cured fishes.]
Yamazaki, H.; Minami, J.; Ichikawa, T.; Kondo, M.
Journal of the Food Hygienic Society of Japan [Shokuhin Eiseigaku Zasshi] 18 (4) 368-374 (1977) [17 ref. Ja, en] [Fac. of Pharmaceutical Sci., Osaka Univ., 133-1, Yamadakami, Suida-shi, Japan]

Polycyclic aromatic hydrocarbons, e.g. 3,4-benzpyrene, 1,2-benzanthracene, 1,2,5,6-dibenzanthracene and chrysene, were not detected in raw fishes, while most of them were detected in gas-treated fish (smoked) at concn. levels of <1 ng/100 g. However, they were not detected in smoked fish which had been wrapped in Al foil. The lipid fraction of fish was found to be the source of the hydrocarbons. TM

34

The effect of processing and storage upon the nutritive value of smoked fish from Africa.
Hoffman, A.; Barranco, A.; Francis, B. J.; Disney, J. G.
Tropical Science 19 (1) 41-53 (1977) [28 ref. En, fr, es] [Tropical Products Inst., 56/62 Gray's Inn Road, London WC1X 8LU, UK]

Tropical lake fish (Tilapia esculenta and T. lidole) were smoked and dried under experimental conditions, and the former stored at 35°C for 3 months. Results of analysis of the muscles of the fresh (freeze-dried) and of smoked fish stored for 1 and 3 months were: moisture 13.9, 14.4 and 14.6%; oil 13.9, 13.7 and 17.3%; protein 82.2, 80.7 and 78.4%; ash 10.4, 4.4 and 4.3%; and glucose 1.2, 0, and 0.1 µmoles/g, resp. Analysis of traditionally smoked fish of the spp. Sardinella aurita, T. lidole and T. nilotica showed 28.2, 62.8 and 6.5% moisture; 20.3, 7.4 and 4.6% oil; and 4.7, 12.4 and 5.5% ash, resp. Net protein utilization (NPU) value from rat feeding trials and amino acid assay revealed that protein damage showed a normal relationship to temp., and that smoking damages protein to a lesser extent than drying without smoke. SP

35

[Process for matje curing of raw herring fillets by smoking to obtain smoked matje fillets and smoked matje salad.] Verfahren einer Matjes-Räucherreifung von rohen Heringsfilets zu Räuchermatjesfilets und Räuchermatjessalat.
Henning, W.
German Federal Republic Patent Application 2 610 064 (1977) [De]

Smoked matje herring fillets are obtained by first treating the surface of the fillets for approx. 10 s with edible liquid acids having a pH of 1-2 by spraying or immersing, etc. in order to inhibit germ growth, and then soaking them in a bath of mild smoke seasoning (1:1 ratio of fish to solution) for approx. 24-48 h. The solution also contains 10-14% salt depending on the fat content of the fish flesh which is approx. 12%. Preferably, the solution also contains a water-soluble smoked food product, e.g. a mixture of sugar and salt at 1-2 kg/100 kg solution. This process obviates the need to cure the whole herrings so that head, bones, etc. can be processed into fish meal. The enzymic curing process is as effective as conventional methods while a novel flavour is imparted to the fish. W&Co

36

[Method for cold smoking food products.]
Egorshin, V. V.; Valyavin, I. G.; Mar'in, G. N.; Rykovskii, Yu. V. **(Union of Soviet Socialist Republics, Tsentral'noe Proektno-konstruktorskoe i Tekhnologicheskoe Byuro Glavnogo Upravleniya Rybnoi Promyshlennosti Azovo-Chernomorskogo Basseina)**
USSR Patent 576 106 (1977) [Ru]

Products, e.g. fish, are cold smoked with reduced process time in a circulating air-smoke mixture by exposing briefly to a smoke-air mixture at a temp. 2-3x greater than that of the circulating mixture and supplied at least once/min for 2-3 s. W&Co

37

[Machine-oriented designing of meat industry plants.]
Mikhailovskii, E. A.; Uskov, V. I.; Dvorak, N. M.; Dvorak, I. D.; Lokhmatikova, A. N.
Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 2, 19-23 (1977) [3 ref. Ru] [Moskovskii Tekh. Inst. Myasnoi i Molochnoi Promyshlennosti, Moscow, USSR]

Computerized planning in smoked meat product factories is discussed, with special reference to cost minimization. Speed and productivity of planning operations are claimed to be improved by the use of computers. STI

38

Curing procedures for smoked chicken.
Stubblefield, J. D.; Hale, K. K., Jr.
Poultry Science 56 (4) 1135-1139 (1977) [16 ref. En] [Dep. of Poultry Sci., Univ. of Georgia, Athens, Georgia 30602, USA]

Subjective analysis of smoked chickens indicated that inclusion of $NaNO_3$ in the cure solution for 18-24 h cure times produced no increase in colour and decreased cured flavour and saltiness scores. Smoked chickens cured for 24 h have higher cured flavour scores, cured yields and cooked yields than those cured for 18 h. In one experiment, cooked yields of 69% were attained for endpoint meat temp. of 80° C, while in another experiment cooked yields of 81% were reached with endpoint meat temp. of 77° C. Equilibration for 24 h produced higher salt content (3.2%) in cooked meat when compared to 4 h equilibration (2.7%). Initiation of curing by immersion of carcasses into brine in frozen state gave cooked meat salt levels of 2.7% while carcasses cured from fresh or thawed states had salt levels of 3.3%. AS

39

Smoke flavour advances.
Olsen, C.
South African Food Review **4** (5) 71 (1977) [En]

The development of 'Scansmoke' smoke flavour, based on organoleptic tests, is discussed. Scansmoke is produced by incomplete combustion of beech wood followed by condensing and water removal. The tarry phase is emulsified (pH 13.5) and an extraction with ether made to remove undissociated compounds. At pH 11.0 a further extraction with ether is made. Compounds with dissociation constants between 11 and 13.5 can be isolated and mixed with approved food carriers. Applications include addition to smoked meat products using a massage/cutting unit ensuring a perfect cured colour and an even smoked flavour. SP

40

[Process for prolonging the aromatization period of smoked seasoning herbs when exposed to open embers and/or fire.] Verfahren zur Verlängerung der Aromatisierungszeit von Räucher-Würzkräutern bei Einwurf in offene Glut und/oder Feuer.
Effenberger, W.
German Federal Republic Patent Application 2 612 156 (1977) [De]

To prolong the aromatizing effect of herbs when exposed to embers or fire, e.g. while grilling meat or fish, the herbs, e.g. rosemary, thyme or juniper, are shredded or ground and mixed with hickory flour, cornflour, beech charcoal and/or other suitable materials which also have smoke aromatizing properties. The mixture is compressed to form spherical or flat pieces the size of which determines the period for which the aromatizing effect will persist. W&Co

41

[Smoked dry sausages: quality requirements for attested products.]
Union of Soviet Socialist Republics, Gosudarstvennyi Komitet Standartov
Soviet Standard **GOST 5.100-68**, 10pp. (1976) [Ru]

This amended standard applies to 16 types of dry smoked sausages, and covers the raw materials, including condiments etc., and casing. Requirements for the finished product include: moisture, $\leqslant$23-30% (depending on type); NaCl, $\leqslant$4.5-6.0%; and $NaNO_3$, $\leqslant$3 mg/100 g. The standard also covers packaging, transport and storage (shelf life $\leqslant$4 months at $\leqslant$12° C and 75-78% RH, or $\leqslant$10 months at -7 to 9° C). KME

42

Group evaluation of volatile and nonvolatile N-nitroso compounds in foodstuffs. [Lecture]
Dikun, P. P.
IARC Scientific Publications No. 14, 57-62 (1976) [3 ref. En] [N. N. Petrov Res. Inst. of Oncology, Min. of Health of the USSR, Leningrad, USSR]

The sequence of operations for analysis of total volatile and non-volatile nitrosamines by a method involving significant reduction in the number of isolation and purification procedures (in order to minimize possible loss of nitrosamines) is given. The main drawback of the method is its relatively low sensitivity, 0.40-0.45 μmol/kg. Analysis of samples of freshly-frozen cod and the same cod after storage for 2 months showed total nitrosamine contents of 0.44 and 0.82 μmol/kg, resp. Smoking the fish gave the following results (μmol/kg): using relatively cold sawdust smoke from a smoke generator, 0.23 and 1.30; with 'Vakhtol' smoking liquor, 0.56 and 0.90; and with conventional wood-fire smoke, 3.8 and 6.0, resp. Thus smoking method and duration of storage affect nitrosamine content. Another group evaluation method (operational sequence given) allowed separate estimation of total contents of volatile and non-volatile (water-soluble) nitrosamines, and showed them to be present in approx. the same ratio (1:4) in both hot-smoked cod and boiled sausage var. 'Doktorskaya'. The possibility of using an analysis method involving measurement of spectra of spontaneous combinational scattering (SCS), or Raman spectroscopy, for detn. and identification is mentioned. [See FSTA (1978) **10** 5C147.] AL

43

[Retention of quality of boiled smoked meat products by means of UV radiation.]
Yushkov, N. A.
Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 2, 67-70 (1977) [3 ref. Ru] [Stavropol'skii Politekh. Inst., Stavropol', USSR]

The right moment of UV irradiation is sought for treating boiled smoked meat products stuffed in treated intestine (sausages, frankfurters) during the technological process; and the effect of the UV treatment on surface microflora development is explored. UV irradiation is successful in destroying the superficial microflora during subsequent storage in containers at <8° C, 80-85% RH and air circulation at 0.1-0.2 m/s. UV irradiation prior to cooling restricts microbial growth on the surface of the stored sausages considerably more than irradiation after cooling. STI

44

The acute toxicity of smoke flavouring (SF).
Fitko, R.; Grabowski, J.; Krzymowska, H.; Markiewicz, K.; Szuperski, T.
Acta Alimentaria Polonica 3 (3) 275-278 (1977)
[En, pl] [Inst. Podstawowych Nauk Weterynaryjnych, ART, Olsztyn, Poland]

The acute toxicity (LD_{50}) of a smoke flavouring (3:1 mixture of phenolic and terpene fractions) was determined in mice, rats and pigs (dose applications 1000-3700, 2500-5000 and 2500-4300 mg/kg body wt., resp.). Results showed that the smoke flavouring had a low acute toxicity, and mainly caused irritation of the alimentary tract, liver and kidney. No haematological changes were found. Females were more sensitive than males. AL

45

Determination of polycyclic aromatic hydrocarbons in wood smoke.
Obiedzinski, M.
Acta Alimentaria Polonica 3 (3) 183-187 (1977)
[19 ref. En, pl] [Inst. Przemyslu Miesnego i Tluszczowego, Warsaw, Poland]

Polycyclic aromatic hydrocarbons (PAH) are extracted from alcoholic alkaline solutions of wood smoke by a solvent, purified by column chromatography, and quantitatively determined by means of gas chromatography. AL

46

Studies on determination of benzo(a)pyrene in smoke flavourings.
Radecki, A.; Lamparczyk, H.; Halkiewicz, J.; Grzybowski, J.
Acta Alimentaria Polonica 3 (3) 209-214 (1977)
[7 ref. En, pl] [Zaklad Chemii Fizycznej, Akad. Med., Gdansk, Poland]

A GLC method has been developed for quantitative detn. of benzo(a)pyrene (BAP) in smoke flavourings, using cyclohexane as solvent for preliminary extraction and featuring careful removal of dimethyl sulphoxide from the cyclohexane extract. Recovery of BAP was 87-90% from samples containing 2 parts/billion BAP; the detection limit was 30 µg. AL

47

A modification of Howard method of benzo(a)pyrene determination in foods.
Kedzierski, B.; Kubacki, S. J.
Acta Alimentaria Polonica 3 (3) 175-181 (1977)
[5 ref. En, pl] [Inst. Przemyslu Fermentacyjnego, Warsaw, Poland]

The modified Howard method [Journal of the Association of Official Analytical Chemists (1966) 49, 611] for benzo(a)pyrene detn. in foods has been elaborated, mainly by omitting the purification with dimethylsulphoxide, changing the sequence of analysis, and replacing TLC by column chromatography on cellulose monacetate. The modified method has been successfully used for >2 yr for benzo(a)pyrene analysis of cereal, and is also being used for smoked fish and meat. Statistical evaluation of the modified method indicated good agreement with the Howard method (mean recovery about 90%, mean coeff. of variation about 70%). AL

48

The analysis of conditions for design of smoking chamber or tunnel.
Adam, M.; Polach, P.
Acta Alimentaria Polonica 3 (3) 279-286 (1977)
[En, pl] [Res. Inst. of Food Eng., Prague, Czechoslovakia]

Optimization of smoking chamber design and operation requires a thorough analysis of 4 main factors influencing the design and operation concept, i.e. properties and dimensions of products to be smoked (inherent conditions of heat and mass transfer), parameters of smoking chamber atm., conditions of operational technology and organization, and design and construction of the equipment proper. AS

49

Application of programmed smoke curing in Polish fish and meat industries.
Pietrzyk, M.
Acta Alimentaria Polonica 3 (3) 293-299 (1977)
[5 ref. En, pl] [Zaklad Tech. Utrwalania Zywnosci i Mikrobiol. Tech., Politechnika, Gdansk, Poland]

The technical characteristics of a modern smoking unit are described, and comparative technical working data are tabulated for hot smoking using various types of kilns (T kiln, Kvaerner kiln and conventional kilns). The yield and processing time for smoking herring, cod, Baltic herring, kipper, mackerel and half-dry sausage are compared for conventional smoking kilns and a T-smoking kiln. The prototype T-kiln meets all basic requirements for efficient and uniform smoke curing, and its modern construction gives considerable qualitative, technological and economic advantages. AL

50

The inhibiting effect of smoke flavouring (SF) upon the autoxidation of lard.
Chomiak, D.; Goryn, A.
Acta Alimentaria Polonica 3 (3) 223-230 (1977)
[7 ref. En, pl] [Inst. Przemyslu Miesnego i Tluszczowego, Warsaw, Poland]

A sample of a Polish smoke flavouring (SF) was examined for its inhibitory effect on the autoxidation of lard samples of 2 different quality grades, using 2 stability tests (active oxygen method and filter paper test method). Results confirmed earlier findings that SF exhibits a pronounced autoxidative activity. A functional description of the relationship between the protective indices and the amount of added SF is proposed. AS

51

[Calculation of the time for de-salting brined fish.]
Storozhenkov, V. G.
Rybnoe Khozyaistvo No. 10, 76-78 (1977) [Ru] [Astrakhanskii Tekh. Inst. Rybnoi Promyshlennosti i Khozyaistva, USSR]

The de-salting time was experimentally determined for Cyprinus (11-18% salt) intended for cold smoking. The desalting was carried out in vessels to 6.5% salt in the fish, using a ratio of 6:2 where 6 is the duration of diffusion/one immersion and 2 is the inter-immersion period. The calculated and experimental data were the starting point for constructing a table indicating the total time of diffusion for Cyprinus desalting. The experimental data on the total time of diffusion did not differ much from the calculated data. STI

52

[Olive or groundnut oil composition for conserving smoked food products, applications thereof and the products obtained.]
Monegasque
French Patent Application 2 335 156 (1977) [Fr]

Smoked food products, particularly fish, e.g. smoked anchovy fillets are improved by steeping in a smoky oil for 15-20 days before boxing them up. The oil consists of $\geqslant$90%, and preferably 96% of olive oil and/or groundnut oil to which has been added 4% of another oil, e.g. soya oil containing a fifth of its wt. of an aromatic natural smoke concentrate containing pyroligneous acid which is obtainable commercially. W&Co

53

Chemical effects of smoke-processing on frankfurter manufacture and storage characteristics.
Sink, J. D.; Hsu, L. A.
Journal of Food Science 42 (6) 1489-1491, 1503 (1977) [31 ref. En] [Meat Lab., Dep. of Food Sci., Pennsylvania State Univ., University Park, Pennsylvania 16802, USA]

Frankfurters (franks) were made by standard commercial practices except for the smoke treatment which involved 4 different methods: solid smoke-aerosol, liquid smoke-aerosol, liquid smoke-external dip, and liquid smoke-internal mix. For control purposes, franks were prepared without any smoke treatment. All franks were packaged and stored at 5°C with samples removed for analyses weekly for 3 wk. Method of smoke application did affect the processed wt. of the franks. Liquid smoke-aerosol treatment produced the heaviest franks; the liquid smoke-internal mix application produced franks lighter in wt. than the other treatments including the nonsmoked control. Smoke-treatment had no significant effect on the fat or total volatile N (TVN, expressed on a fat-free basis) content of the franks. However, it did affect the amounts of moisture, phenol, free fatty acids (FFA) and TVN as well as the pH and 2-thiobarbituric acid (TBA) values. The use of the liquid smoke-external dip significantly lowered the nitrite content of the franks when compared to all other treatments; the nitrite content of the others did not differ from each other. As the phenol content increased, pH decreased. Generally, storage had no effect on the frankfurter properties evaluated in these studies. However, pH was seen to drop then rise again whereas the amount of FFA rose then fell during the 3-wk period. IFT

54

[The regulations for discharge of contaminants, and their consequences for the meat industry.] Das Immissionsschutzgesetz und seine Folgerungen für die Fleischwirtschaft.
Reuter, H.
Fleischerei 28 (12) 51-52, 54 (1977) [6 ref. De] [Stettiner Strasse 40, D-8650 Kulmbach, Federal Republic of Germany]

Minimization of environmental pollution by smoke from factories manufacturing smoked meat products is discussed, with reference to: legal requirements in the Federal Republic of Germany; use of tall chimneys to maximize atmospheric dilution of the smoke; total thermal combustion of smoke constituents; partial thermal combustion; catalytic combustion; electrostatic processing; use of an integral smoking system in which smoke is recycled; and use of systems based on smoke generation by means of superheated steam. AJDW

55

Experiences with the use of electrostatically filtered smoke for smoking of meat products.
Rusz, J.
Acta Alimentaria Polonica 3 (3) 301-306 (1977) [9 ref. En, pl] [Res. Inst. of Meat. Ind., Brno, Czechoslovakia]

The chemical composition was determined in normal and filtered smoke; the latter was obtained using a laboratory electrostatic air filter with ionizing voltage of 10-14 kV. Average chemical composition of 15 samples of normal and filtered smoke, resp., was (mg%): acids, 211 and 150; phenols 7.5 and 2.7; and carbonyls, 347 and 192. Content of benzo(a)pyrene was reduced from 38.5 to 0.8 µg/l. Sensory evaluation of meat products (Moravian sausage, wieners, cabanos and debrecene sausages) for flavour, smoky aroma and colour was carried out. Filtered smoke gave products with less intense outside colour and smoky aroma, and the flavour and aroma profiles were delicate and without the undesirable tarry note. AL

56

The detection of liquid smoke aromas smoke flavourings in foodstuffs.
Baltes, W.; Bange, J.
Acta Alimentaria Polonica 3 (3) 325-333 (1977) [En, pl] [Inst. für Lebensmittelchem., Tech. Univ., Berlin (West)]

Some liquid smoke products were examined for presence of suitable smoking indicator compounds; guaiacol was selected. The concn. of guaiacol in some liquid smoke products, smoke salts and dextroses is given. To distinguish whether commercial sausages had been treated with liquid smoke added to the sausage mass or had been smoked traditionally, samples were taken from the centre of the sausages; absence of guaiacol indicated conventional smoking. To distinguish between sausages treated with liquid smoke (40-50 g/100 kg meat) or smoked preparations (200-1000 g/100 kg meat) the expected concn. of guaiacol was from 0.3 to >2 p.p.m. and from 0.03 to 0.3 p.p.m., resp. AL

57

Polycyclic aromatic hydrocarbons in smoked meat products. An application of a new method.
Potthast, K.
Acta Alimentaria Polonica 3 (3) 195-201 (1977)
[20 ref. En, pl] [Bundesanstalt für Fleischforschung, Kulmbach, Federal Republic of Germany]

A new method developed for the extraction of polycyclic aromatic hydrocarbons (PAH) from meat products involved the use of (i) propylene carbonate. Extracts obtained with (i) and petroleum ether can be determined and separated without complications either by TLC and fluorometric evaluation or GLC. Amounts of PAH extracted by (i) were considerably higher than when using acetonitrile, dimethylsulphoxide or dimethylformamide. Contents of PAH were determined in some smoked meat products, smoke preparations and smoked cheese. Benzo(a)pyrene (BAP) contents found in the rind of black smoked ham with <0.2 parts/billion BAP in the edible part were 0.84-3.05 parts/billion; therefore removal of rind greatly reduces the harmful smoke substances in the product overall. AL

58

Determination of phenols in smoked meat products.
Potthast, K.
Acta Alimentaria Polonica 3 (3) 189-193 (1977)
[14 ref. En, pl] [Bundesanstalt für Fleischforschung, Kulmbach, Federal Republic of Germany]

By means of steam distillation at high boiling temp. (130-170° C) the phenolic compounds of smoke were isolated from smoked meat products. Eugenol, syringaldehyde, acetosyringone and acetovanillone were predominant in hot smoked meat products, whereas guiaacol, maltol, phenol and m-cresol were predominant in cold smoked products. AS

59

Formation of NO and reaction with meat in smoke chambers directly heated with gas.
Möhler, K.
Acta Alimentaria Polonica 3 (3) 163-167 (1977)
[9 ref. En, pl] [Dep. of Food Sci., Tech. Univ., Munich, Federal Republic of Germany]

Nitrogen oxide or nitrous gases which are mainly formed in gas heated smoke chambers react with muscle meat and can lead to the formation of curing pigment. For model experiments in the laboratory an experimental set-up is described. AS

60

Smoke flavouring and its bacteriological and antioxidative effects.
Olsen, C. Z.
Acta Alimentaria Polonica 3 (3) 313-324 (1977)
[4 ref. En, pl] [P. Broste Manufacturing AS, 1415 Copenhagen, Denmark]

A finished smoke flavouring 'scansmoke' (SC), its phenol and terpene fractions (PF, TF) and 3 distillates obtained by distilling the phenol fraction under vacuum (F1, F2, F3) were chemically analysed and their bactericidal and antioxidative activities determined. Results of bacteriological tests with Staphylococcus aureus 758/III in nutrient broth at a basic innoculation concn. of 10^5/ml showed that 147 and 222 p.p.m. SC prolonged the lag phase by 4 and 14 days resp.; at 333 p.p.m. exponential growth did not start during the test period; and at higher SC concn. the bacteria were killed. When the basic concn. of Staph. aureus was only 10^2/ml, total killing occurred with 147 p.p.m. SC. At 147 p.p.m. SC and a basic concn. of Staph. aureus of 10^5/ml, TF and F1 had no bactericidal affect (lag phase unaffected), F2 prolonged the lag phase during the 14-day test, and PF and F3 caused a reduction in bacterial concn.; at 10^2/ml concn., TF and F1 had no bactericidal effect, and all other samples killed the microflora. Micrococci growth was determined in pork loin with varying quantities of added SC (45-195 p.p.m.) incubated at 20° C, and in bacon with 0-45 p.p.m. SC at 10° and 20° C. On addition of 45 p.p.m. SC, the length of the lag phase corresponded to that caused by reduction of temp. from 20° to 10° C. Lactobacilli were resistant to SC in the cured vacuum-packed bacon. AL

61

Influence of combustion conditions on the composition of carbonylic, carboxylic, polynuclear hydrocarbons, and phenolic compounds present in wood smoke.
Borys, A., Jr.; Klossowska, B.; Obiedzinski, M.; Olkiewicz, M.
Acta Alimentaria Polonica 3 (3) 335-346 (1977)
[6 ref. En, pl] [Inst. Przemyslu Miesnego, Warsaw, Poland]

Preliminary data are presented on the influence of combustion conditions, i.e. combustion rate, combustion temp. and air flow rate through the combustion bed, on the qualitative composition of isolated fraction of 5 main compounds in each of the 4 groups of smoked constituents (carbonylic, phenolic and carboxylic compounds and polynuclear hydrocarbons). Calculated values for 4 mathematical formulae (for combustion conditions) are tabulated. AL

62

The influence of generation parameters upon antioxidative properties of wood smoke.
Daun, H.; Tilgner, D. J.
Acta Alimentaria Polonica 3 (3) 231-236 (1977)
[10 ref. En, pl] [Katedra Tech. Produktow Zwierzecych, Politechnika, Gdansk, Poland]

The dispersed (particle) phase of all wood smoke samples, generated at widely varied parameters, shows strong antioxidative properties. The antioxidative activity of this phase decreases with increasing oxidation temp. Change of the pyrolysis temp. and change of air supply did not influence significantly the antioxidative activity. The dispersing (vapour) phase showed an exceedingly low antioxidant activity or no activity in all smoke samples. AS

63

Novel technology of the preparation of smoke flavouring.
Kulesza, J.; Podlejski, J.; Gora, J.; Kolska, J.; Stolowska, J.
Acta Alimentaria Polonica 3 (3) 287-292 (1977)
[5 ref. En, pl] [Inst. Podstaw Chemii Zywnosci Politechniki, Lodz, Poland]

An improved method of obtaining smoke flavouring from condensed wood smoke was developed. It consists of the fractional distillation of the wood smoke condensate, previously eliminating nitrogen bases, and extractive distillation with glycerol. AS

64

Identification of polynuclear aromatic hydrocarbons in wood smoke.
Obiedzinski, M.; Borys, A.
Acta Alimentaria Polonica 3 (3) 169-173 (1977)
[14 ref. En, pl] [Inst. Przemyslu Miesnego i Tluszczowego, Warsaw, Poland]

27 individual or groups of compounds were identified by means of combined gas chromatography-MS in a preliminary analysis of polynuclear aromatic hydrocarbons in wood smoke. AL

65

Smoke odour components and carcinogenic hydrocarbons of wood vinegar and wood tar.
Kishimoto, S.; Hirano, K.
Acta Alimentaria Polonica 3 (3) 237-245 (1977)
[11 ref. En, pl] [Dep. of Agric., Tokyo Univ. of Education, Tokyo, Japan]

Smoke odour components and carcinogenic hydrocarbons were studied in pyroligneous liquors and tars obtained from wood, lignin, cellulose and samples of commercial smoke liquids. It was found that the weak acid fraction of wood pyroligneous liquors had a pleasant smoky odour and consisted mainly of low mol. wt. phenols formed by pyrolysis of lignin, whilst the neutral fraction had a weak smoky odour. The odour of the weak acid fraction from cellulose pyroligneous liquors obtained at 320-400° C was assessed as 'sweet'. Wood tar distillates obtained in the boiling range 65-94° C at 80 mm Hg had a pleasant odour, the fraction at 84-90° C obtaining particularly good scores. Carcinogenic hydrocarbons were not detected in distillates from wood pyroligneous liquors and in the 65-94° C fractions from wood tar distillates. AS

66

Isolation and identification of some components of the lower-boiling fraction of a commercial smoke flavoring.
Radecki, A.; Grzybowski, J.; Halkiewicz, J.; Lamparczyk, H.
Acta Alimentaria Polonica 3 (3) 203-207 (1977)
[8 ref. En, pl] [Zaklad Chemii Fizycznej, Akad. Med., Gdansk, Poland]

A group of furan derivatives was isolated from a Polish commercial smoke flavouring by preparative GLC. Identification of 6 components of this group was made by UV spectrophotometry and MS. 3 of them (2,3-dimethyl-5-ethylfuran, 4-methylfurfural and 3,4-dimethyl-5-ethylfuran) were detected for the first time in smoked flavourings. AL

67

Odour intensity and quality of smoke flavourings.
Barylko-Pikielna, N.; Wasowska, E.; Miler, K.; Pietrzak, E.
Acta Alimentaria Polonica 3 (3) 215-222 (1977)
[12 ref. En, pl] [Inst. Zywnosci i Zywienia, Warsaw, Poland]

Odour intensity and quality of a Polish commercial smoke flavouring and its fractions (separated according to their boiling temp. of < 120° C, 120-130° C and 130-160° C, resp.) were studied. Experimental results of detection and difference thresholds were analysed based on known relationships described by the Weber-Fechner law. Also preliminary quality characteristics of the odour of the smoke flavouring and its fractions at different concn. were determined. AL

68

Proposal for a Council Directive amending for the sixth time the Council Directive of 23 Oct., 1962 on Colouring Matters in Foodstuffs.
European Economic Community, Council of Ministers
Official Journal of the European Communities 20 (C 300) 3-5 (1977) [3 ref. En]

It is proposed that Article 2 of the Directive of 23 Oct., 1962, is amended to read as follows 'By way of derogation from Article 1, Member States may authorize the use in foodstuffs of the substances listed in Annex II. Annex I to the Directive of 23 Oct., 1962, is amended by the insertion of riboflavin-5-phosphate (E 106). Iron oxides and iron hydroxides (E 172) and titanium dioxide (E 171) are transferred from Part II to Part I. Annex II is replaced by the following: colouring matters for both mass and surface colouring (Brilliant blue FCF, Brown FK, Chocolate brown, Red 2G, Yellow 2G); and substances for diluting or dissolving colouring matters (ethyl acetate, diethyl ether, glycerol monoacetate, glycerol diacetate, glycerol triacetate, isopropyl alcohol, propylene glycol, acetic acid, sodium hydroxide, and ammonium hydroxide). [See preceding abstr.] VJG

69

Proposal for an EEC Directive amending for the thirteenth time Directive 64/54/EEC on Preservatives in Foodstuffs.
European Economic Community, Council of Ministers
Official Journal of the European Communities 20 (C 300) 2-3 (1977) [En]

Article 1 of this proposal extends to 31 Dec., 1980, the derogation, in the Treaty of Accession (applicable to Denmark, Ireland and the UK) permitting the use of liquid smoke solutions. It also extends this derogation to all other Member States. Article 2 of the proposal seeks to add formaldehyde (E 240) to the permitted list of preservatives, but to restrict its use to Grana Padano cheese and at such a level that there is no residue in the final product when marketed. [See preceding abstr.] VJG

70

Separation of polycyclic aromatic hydrocarbons and determination of benzo[a]pyrene in liquid smoke preparations.
Radecki, A.; Lamparczyk, H.; Grzybowski, J.; Halkiewicz, J.
Journal of Chromatography 150 (2) 527-532 (1978) [16 ref. En] [Dep. of Physical Chem., Med. Acad., K. Marksa No. 107, 80-416 Gdansk, Poland]

Work aimed at developing a precise method (GLC or HPLC) for assaying benzo[a]pyrene in liquid smoke preparations is described. AL

71

The zootechnical indexes and pathological changes in animals after smoke flavouring (SF) application in subacute toxicity test.
Fitko, R.; Markiewicz, K.; Markiewicz, Z.; Szuperski, T.; Krzymowska, H.
Acta Alimentaria Polonica 3 (3) 269-274 (1977) [En, pl] [Inst. Podstawowych Nauk Weterynaryjnych, ART, Olsztyn, Poland]

Feeding trials were conducted with Polish Large White swine, Swiss Albino mice and Wistar rats, to evaluate the toxicity of Polish-manufactured smoke-based flavouring (SF) for use in foods. Pigs received daily doses of 200, 600, 1000 or 1400 mg/kg body wt.; the rats and mice received diets containing 0.1, 0.5, 1.0 or 2.0% SF. The experimental diets were fed for 90 days, after which the animals were slaughtered. Haematological studies, biochemical studies on urine and blood samples and histological studies on various organs were conducted, and all animals were dissected. In both pigs and rodents, SF decreased feed utilization efficiency; in pigs, liver wt. tended to increase and kidneys tended to atrophy as a result of dietary SF. Histopathological changes were observed in various organs; biochemical and haematological effects were small. It is concluded that adverse effects of SF at the doses studied are mainly attributable to irritant action of SF constituents. AJDW

72

The problem of 3,4-benzopyrene in smoked meat products. [Review]
Potthast, K.
Fleischwirtschaft 58 (1) 38-40; 69-70; 72-73 (1978) [many ref. En, de] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

This review discusses German legislation on 3,4-benzpyrene in meat products, detn. of its carcinogenic effect, methods of limiting its concn. and its detn. in smoked meat products. RM

73

[Addition of haemoglobin to stabilize the colour of smoked products and to reduce the addition of nitrite.]
Tsimbalova, N. M.; Inzhiyants, A. A.; Petrenko, O. P.; Toptei, M. I.; Ivanchenko, L. V.
Pishchevaya Promyshlennost' Respublikanskii Mezhvedomstvennyi Nauchno-tekhnicheskii Sbornik No. 23, 70-75 (1977) [Ru]

Addition of blood cell components into smoked products acts as colour improver and stabilizer; the nitrite addition can consequently be reduced to 30%. Best results have been obtained with 0.2-0.3% concn. of haemoglobin preparation in the sausage emulsion. STI

74

Hedonic response to smoke flavouring odour.
Miler, K.; Ziajka, B.; Barylko-Pikielna, N.
Acta Alimentaria Polonica 3 (3) 247-254 (1977) [12 ref. En, pl] [Inst. Przemyslu Miesnego, Warsaw, Poland]

A batch of commercially-prepared smoke flavour and 3 phenolic fractions obtained therefrom by distilation were used in sensory studies. Solutions (concn. 250-4000 p.p.m.) of the smoke flavour and its phenolic fractions were presented to panels for hedonic evaluation of odour; ratings were marked on a 10 cm unstructured graphical scale with marked boundary values. Similar studies were conducted on various blends of 2 of the phenolic fractions, at total concn. of 750 and 1000 p.p.m. Tables and graphs of results are given. The experimental results were compared with values calculated using Tilgner & Miler's equation [Roczniki Technologii i Chemii Zyunosci (1969), 127-138]. The experimental and calculated results agreed well, confirming the validity and applicability of the formula. The relative influence of the 3 phenolic fractions on the hedonic rating are discussed. Summation of hedonic ratings for blends of the constituents is also discussed; predicted and experimental values agreed well. AJDW

75

[Methods for studying the smoking process and smoked products.] Metody issledovaniya protsessa kopcheniya i kopchenykh produktov. [Book]
Kurko, V. I.
190pp. (1977) [149 ref. Ru] Moscow, USSR; Pishchevaya Promyshlennost'. Price 1.98r

The nature and physico-chemical composition of smoke is discussed as well as the smoking process and subsequent storage of smoked products. Quality assessment of smoked products using methods commonly used in scientific practice is dealt with. The following chapters are included: Chemical composition of smoke (pp. 7-47); Mechanical action of smoke on the product (pp. 47-72); Methods for studying the nature of the specific flavour and aroma of smoked products (pp. 72-101); Chages taking place during the smoking process and during storage of smoked products (pp. 101-134); Methods for evaluation of the quality of smoked products in research laboratories (pp. 134-156); and Analytical methods used for the study of the smokeless curing process (pp. 156-179). STI

76

Preparation of smoke cured fillets from oil sardine.
Muraleedharan, V.; Valsan, A. P.
Fishery Technology 13 (2) 146-152 (1976) [14 ref. En] [Cent. Inst. of Fisheries Tech. Unit, Calicut-673005, India]

Studies were conducted on manufacture of smoke-cured oil sardine (Sardinella longiceps). Variables studied included duration of dipping in saturated brine, use of preservatives (acetic acid, sodium propionate, sodium benzoate, potassium sorbate), use of BHA for control of rancidity, and heat treatment at 125°C for 15 min. Tables of results are given showing the storage life, total volatile N content, organoleptic properties, rancidity, and incidence of infestation with insects or fungi in the stored product. The results show that: dipping in saturated brine for 15 min is optimal; draining for 10 min after dipping is necessary for uniform smoking; smoking for 6 h at 70-80°C gave good results; of the preservatives tested, 3% sodium propionate gave the best control of fungi, without adverse effects on organoleptic properties; addition of 0.1% BHA to the dip bath controlled rancidity for 4 months; and heat treatment at 125°C for 15 min (followed by packaging in cellophane) controlled insect growth for 5 months. AJDW

77

Is steam smoke suitable for cold smoke curing and does it have a fungicidal, fungistatic effect? [Thesis Original title Eignet sich Dampfrauch zur Kalträucherung und übt er eine fungizid-fungistatische Wirkung aus? 149pp., De]
Kersken, H.
Dissertation Abstracts International, C 37 (3) 558 (1977) [En] [Univ., Giessen, Federal Republic of Germany]

The suitability of the steam smoke process, developed for hot curing, for the cold smoke curing of raw sausages was investigated. The fungicidal and fungistatic effect of this smoke on 6 fungi spp. which occur most frequently on raw sausages was examined, in model and practical experiments. AS

78

[Rational utilization of raw materials and intensification of manufacture of hot smoked products.]
Berezenko, A. M.; Yavorskii, M. I.
Pishchevaya Promyshlennost' Respublikanskii Mezhvedomstvennyi Nauchno-tekhnicheskii Sbornik No. 23, 50-57 (1977) [16 ref. Ru]

The extent of removal of membranes from 1st and 2nd grade beef was studied, and 2, 3 or 5 class quality grade schemes were developed. Standardization of pork on the basis of its chemical composition is discussed, and the technology of manufacture of hot-smoked products from meat of animals showing good fattening characteristics was evaluated. It is suggested that experimental data should be the basis of selection, brining and emulsification of meat. Rationalization of utilization of raw materials, improvement of labour productivity and manufacture of high-quality products with a predetermined moisture content are considered. STI

79

[Effect of thermal processing on the ripening of sausages manufactured with the addition of microbial starters.] [Lecture]
Krylova, V. V.; Likhonosova, N. D.; Mikhailova, M. M.; Mirzoeva, V. Sh; Chistyakova, T. G.; Anisimova, I. G.; Krasnova, N. A.; Osipova, V. I.; Klochkova, G. I.
Proceedings of the European Meeting of Meat Research Workers No. 23, 13:1-13:14 (1977) [6 ref. Ru, De] [Vses. Nauchno-issled. Inst. Myasnoi Promyshlennosti, Moscow, USSR]

Sausages with a relatively high moisture content (up to 38%) were treated thermally and smoked (at 22° and 25°C); the optimal manufacturing parameters were established on the basis of physicochemical, microbiological and sensory analyses. The advantages of use of microbial starters were proved, and a technological scheme for manufacturing these sausages was proposed; it comprises 72-h ripening and 17-day drying in a smoking box. Maturation proceeds at temp. of $\leqslant 25°C$ and RH $\leqslant 75\%$ for 3 days. In this technique, the risk of development of undesirable microflora is reduced, and growth of lactobacilli is enhanced during the drying phase, whereby the quality of the finished product is improved. [See FSTA (1978) 10 8S1048.] STI

80

Study into the technology of fresh-smoked sausage production with respect to the development of automatic control system. [Lecture]
Gnoevoi, P. S.; Bednarchuk, A. A.; Mikhailovskii, E. A.; Uskov, V. I.; Mitin, V. V.
Proceedings of the European Meeting of Meat Research Workers No. 23, J1:1-J1:10 (1977)
[En, Ru] [Vses. Nauchno-issled. Inst. Myasnoi Promyshlennosti, USSR]

A general programme for the MIR-2 computer was developed to enable the calculations and diagrams required for the automation of the given process to be produced. Fresh smoked sausages were used as the experimental model. The study resulted in the development of a control system governed by computer. Specific reference is made to drying chamber design and automation. [See FSTA (1978) 10 8S1048.] STI

81

[Improvement in the thermal processing of sausages.] [Lecture]
Brazhnikov, A. M.; Denisyuk, E. A.; Karpychev, V. A.; Krylov, V. V.; Rogov, N. A.
Proceedings of the European Meeting of Meat Research Workers No 23, J3:1-J3:17 (1977) [Ru, De] [Moskovskii Tekh. Inst. Myasnoi i Molochnoi Promyshlennosti, Moscow, USSR]

Two methods aimed at improving the heat processing of smoked products are discussed with respect to the thermophysical processes involved, and particularly in order to shorten the production time. The 1st was a precise computation of the equation of thermal conductivity with thermal potentials, the 2nd was an approx. solution of a quasi-optimal requirement with a method based on the hypothesis of a thermal front. The role of the law governing temp. changes in the medium, and the heat transfer coeff. are discussed. A method was developed which permits thermal processing within the shortest period, while taking into account the need to limit the temp. on the surface of the products. [See FSTA (1978) 10 8S1048.] STI

82

The effect of proteinous protective coatings on the quality of dry-smoked meat products. [Lecture]
Babloyan, O. O.; Golovanova, P. M.; Gorbatov, V. M.; Komissarova, L. R.; Lapteva, L. I.
Proceedings of the European Meeting of Meat Research Workers No. 23, M2:1-M2:21 (1977) [8 ref. En, Ru] [Vses. Nauchno-issled. Inst. Myasnoi Promyshlennosti, Moscow, USSR]

The effect of proteinaceous protective coatings, based on molecularly dispersed collagen, on the quality of dry-smoked pork products (bellies) was studied. Ready-to-cook products were coated by immersion in a liquid film-forming composition, followed by coagulation in an NaCl solution; a protective layer was formed in the form of a gel, permeable to smoke components. The coating was a semi-transparent film, 50-60 μm in thickness, adhering closely to the product. It differed only slightly from proteinaceous sausage casings. Due to its low water and water vapour permeability and practically complete air and fat impermeability, the coating helps retention of the product's colour, flavour and tenderness, and improves its keeping quality. [See FSTA (1978) 10 8S1048.] STI

83

[Production of smoked sausages with the addition of fish muscle tissue.] [Lecture]
Verkhoturova, F. I.; Rekhina, I. I.
Proceedings of the European Meeting of Meat Research Workers No. 23, O3:1-O3:16 (1977)
[11 ref. Ru, De] [Atlanticheskii Nauchno-issled. Inst. Morskogo Rybnogo Khozyaistva i Okeanografii, Moscow, USSR]

A technology for meat-and-fish smoked sausage production was developed. The sausages contain 40% meat, 40% fish muscle tissue and 20% lard. The final products do not differ in appearance from similar pure meat products. They have a good flavour, and contain 25-30% protein and 10-15% fat. The paper also includes data for technological and biochemical characteristics of the raw materials used, and details of the production process applied. Changes in non-protein N during heat treatment of the sausages are also covered. [See FSTA (1978) 10 8S1048.] STI

84

Food-hygiene toxicological evaluation of the occurrence of cancerogenic hydrocarbons in smoked products.
Engst, R.; Fritz, W.
Acta Alimentaria Polonica 3 (3) 255-267 (1977)
[27 ref. En] [Cent. Inst. for Nutr., Acad. of Sci., Potsdam-Rehbrücke, German Democratic Republic]

Health hazards from carcinogenic hydrocarbons in foods are discussed, with reference to effects of cooking and smoking methods on the formation and accumulation of carcinogenic hydrocarbons, the relation between food processing methods and incidence of cancers of the gastrointestinal tract, problems of evaluation of carcinogenic effects in man, and establishment of hygienic standards limiting contents of carcinogens in foods. Experimental data are given for contents of carcinogenic hydrocarbons in sausages smoked under various conditions, smoke concentrates, smoking oils, etc. It is concluded that: commercially-available smoked meat products generally have fairly low polycyclic aromatic hydrocarbon concn.

(< 1.62 μg benzo[a]pyrene/kg in the samples studied); synthetic sausage casings retained approx. 90% of the carcinogenic constituents of the smoke; soot from a hot-smoking chamber has a benzo[a]pyrene content approx. 4 × that of soot from a cold-smoking chamber; smoke preparations treated to reduce carcinogen concn. contained only traces of benzo[a]pyrene; smoking oil (made by blowing beech smoke into refined vegetable oil) contained 70 μg carcinogenic hydrocarbons/kg; salmon products processed in this oil contained < 3.8 μg benzo[a]pyrene/kg; softwood smoke gave markedly higher benzo[a]pyrene concn. than hardwood smoke; and smoked fish without skin contained an average of 1.39 μg benzo[a]pyrene/kg, vs. 8.55 μg/kg for smoked fish with skin. AJDW

85

[Studies on the content of carcinogenic hydrocarbons in smoked foods in the German Democratic Republic and in Hungary.] Untersuchungen zum Gehalt krebserzeugender Kohlenwasserstoffe in Räucherwaren der DDR und der Ungarischen VR.
Fritz, W.; Soos, K.
Nahrung 21 (10) 951-959 (1977) [26 ref. De, en, ru] [Zentralinst. für Ernährung, Potsdam-Rehbrücke, German Democratic Republic]

Data are given for the concn. of carcinogenic polycyclic aromatic hydrocarbons (including anthracene, pyrene, fluoranthene, benzo(a)pyrene benz(a)anthracene, benzo(e)pyrene and benzo(g,h,i)perylene) in a wide range of smoked meat products and selected other foods produced in the German Democratic Republic and Hungary. Average values for benzo(a)pyrene concn. in German products include (μg/kg): industrially-smoked products, 0.43; artisanal smoked products, 0.76; overall average for meat products, 0.55; and smoked fish (without skin), 1.39. Mean values for Hungarian products include the following (μg/kg): industrially-smoked meat products, 0.6; home smoked meat products, 0.74; overall average for meat products, 0.7; smoked cheese, 0.85; and products smoked (using soft wood) by a Slovenian ethnic minority, 4.16. This Slovenian minority has a considerably higher incidence of stomach cancer than the population in general. IN

86

Device for imparting smoke flavor to liquids.
Howard, W. E.
United States Patent 4 077 312 (1978) [En]

Apparatus is described for use in a smoky environment at atmospheric pressure and temp. to impart a smoked flavour to prepared liquid food products. IFT

87

[Storage characteristics of blue whiting, and new methods for its processing.] Lagerfähigkeit von Blauem Wittling und neue Techniken der Verarbeitung.
Bussmann, B.
Informationen für die Fischwirtschaft 25 (2) 65-67 (1978) [De] [Inst. für Biochem. & Tech., Hamburg, Federal Republic of Germany]

Blue whiting are soft in body texture, and undergo relatively mild rigor mortis; considerable damage may occur during storage in ice, rendering the fish unsuitable for mechanical filleting. An orange/red to green discoloration, originating in the viscera, may also adversely affect the quality of fillets from blue whiting stored in ice. Studies were conducted on storage characteristics of fillets or comminuted blue whiting meat frozen shortly after capture and stored at -30° C for < 1 yr. The results showed that the texture and flavour of fillets remained excellent throughout storage. Organoleptic properties of the frozen comminuted meat were considerably inferior to those of fillets, the flavour being weak and the texture being dry and crumbly. Studies were conducted on the potential for improvement of the texture of rapidly-salted and hot-smoked blue whiting fillets by holding in soybean oil; the results showed a marked improvement in texture as a result of this treatment. Hot-smoked fillets were more fibrous than rapidly-salted fillets. AJDW

88

Hot smoke fish curing.
Caurie, M.; Lee, T. C.; Salomon, M.; Chichester, C. O.
Journal of the National Science Council of Sri Lanka 2 (1) 77-86 (1974) [47 ref. En] [Dep. of Food & Resource Chem., Univ. of Rhode Island, Kingston, Rhode Island 02881, USA]

This review discusses the use of direct wood fire as a source of energy and smoke to dry and preserve fish in the developing countries. It covers various treatment and handling methods as well as the physical and chemical nature of the smoke. It points out that the present traditional methods are inefficient and wasteful of energy and smoke and cites attempts made to improve on them. It discusses the dynamic equilibrium between the particulate and gaseous smoke fractions. The compounds in the gaseous fraction are said to be more directly involved in the development of colour, odour and flavour, while those of the particulate fraction serve as a reservoir. Phenolic compounds are found to be particularly active in the smoking process. The nutritional and health effects of the use of high temp. in the smoking process are also discussed (reduction of carcinogens by controlling temp. at the point of smoke generation to < 400° C). AS

89

Smoke flavour composition.
Scanrog & Co. A/S
British Patent 1 498 264 (1978) [En]

Smoke flavour compositions containing stabilizing gelatins are used in flavouring meat and meat products. The compositions may be used with simultaneous brine curing. IFT

90

Smoking of meats. [Lecture]
Wistreich, H. E.
Proceedings of the Meat Industry Research Conference pp. 37-41 (1977) [11 ref. En] [B. Heller & Co., Chicago, Illinois, USA]

The author reviews the use of smoke as a preservative and for flavouring and colouring meat; gives the structural formulae of the principal components of smoke (cellulose, hemicellulose, lignin); and outlines the importance of the condensibles fraction (acids, carbonyls, phenolics and polycyclic hydrocarbons) of smoke. A brief account is also given of the application of liquefied smoke in meat processing. [See FSTA (1978) 10 9S1347.] HBr

91

[Modern Czechoslovakian equipment for heat treatment of sausage products.] Moderne Ausrüstungen aus der CSSR zur thermischen Behandlung von Wurstwaren.
Gnoevoj[Gnoevoi], P.; Kozlov, Ju.[Yu.]
Fleisch 31 (12) 230-231 (1977) [De]

The design, construction and operating characteristics of Czechoslovakian equipment for hot-smoking of sausage products are described. Equipment considered includes: the Mikulov 4 Universal hot smoking unit; the Aktua continuous tunnel-type smoking unit; the AVKP-800 smoke generator (smoke temp. automatically controlled to 320-380° C); and the GIPA-901 cleaning unit for removal of smoke residues from surfaces in smoking chambers. IN

92

Gas chromatographic determination of methanol traces in presence of other volatile carbonyl compounds.
Merat, E.
Journal of Chromatography 153 (2) 530-531 (1978) [1 ref. En] [Lab. Cantonal de Chimie, Inst. d'Hygiene, Case Postale 109, CH 1211 Geneva 4, Switzerland]

A gas chromatographic method using 2,4-dinitrophenylhydrazine (DNP) reagent was found suitable for detn. of formaldehyde at the 10 p.p.m. level in concn. liquid apple and smoke flavours. The method involves adding excess DNP reagent to the sample in a test tube, standing for 15 h, then just before injection extracting the derivative in benzene. AL

93

A sensitive method for the colorimetric determination of volatile nitrosamines in food products and air.
Ceh, L.; Ender, F.
Food and Cosmetics Toxicology 16 (2) 117-121 (1978) [16 ref. En] [Dep. of Biochem., Vet. Coll. of Norway, PO Box 8146, Dep. Oslo 1, Norway]

A quantity of food containing >0.1 µg nitrosodialkylamine, but preferably 1-10 µg, was extracted for 45 min with a vol. of freshly distilled water equal to 5 × the dry wt., at a temp. of about 90-95° C in a boiling water bath. The heated mass was filtered, washed twice with distilled water and concentrated by distillations from alkaline and acid solution. For smoked fish and smoked meat products a further purification step was needed to remove indole derivatives. The nitrosamines were then reduced with Zn and HCl, followed by oxidation to monoalkylhydrazines and coupling of these with p-dimethylaminobenzaldehyde. Photometry of the resulting alkylaldazine complex at 458 nm, allows determination of N-nitrosodimethylamine in amounts down to 0.1 µg. Factors affecting the yield of the alkylaldazine complex and optimum conditions for the determination are discussed. This method has been used for the determination of N-nitrosodimethylamine in food products at concn. as low as 0.5 µg/kg. VJG

94

[Improvement of thermal efficiency of fish drying and smoking equipment.]
Nikitin, B. N.
Rybnoe Khozyaistvo No. 2, 73-74 (1978) [Ru] [Giprorybflot, USSR]

Potential recirculation of hot and cold smoking agents and fish drying agent is discussed, as normally about 80% of heat produced is released into the atmosphere from units without recirculation. A rationalized scheme for smoking equipment using recirculated smoke-air mixture is presented; the external additional air is heated to 220° C and moisturized before blending with the air-smoke mixture. The total savings in heat for hot smoking were 180 000 kcal/h in a recirculation programme with a productivity of 3000 kg/shift, which corresponds to 25.7 kg of fuel equivalent/h. STI

95

Smoking procedures and their effect on 3,4-benzpyrene and other smoke components in smoked meat products. [Review]
Potthast, K.
Fleischwirtschaft 58 (3) 340, 342-348; 371-375 (1978) [many ref. En, De] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

This review discusses various smoke production methods, the effect of the temp. of wood pyrolysis on the phenol, carbonyl and carboxylic acid contents of the smoke condensates, and the concn. of polycyclic aromatic hydrocarbons (PAH) and phenols in smoked meats. It points out that the qualitative and quantitative composition of smoke changes with the temp. of pyrolysis; PAH increase linearly between 400° and 1000° C, while phenols reach a max. at 600° C. PAH concn. was considerably higher in hot-smoked than in cold-smoked products (max. 3,4-benzpyrene concn. 56.04 and 5.60 parts/billion in hot- and cold-smoked black ham, resp.). The 1 part/billion limit for 3,4-benzpyrene was hardly ever exceeded when wet smoke or friction smoke was used, but frequently when smoke from smouldering wood was used (especially if it contained a high proportion of soot particles). In modern plants where smoke generators are separate from smoking chambers 3,4-benzpyrene may be removed by spraying and filtering or by cold traps. Whereas the intensity of smoking aroma increases with the concn. of phenols (guaiacol, eugenol, etc.), this does not apply to PAH, which could be removed without adverse effects on the flavour. RM

96

[Drying of raw smoked sausages in an atmosphere with varying parameters.]

Levin, A. M.; Rodin, A. K.; Ivanov, V. A.; Slepykh, G. M.

Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 1, 83-85 (1978) [3 ref. Ru] [Saratovskii Politekh. Inst., Saratov, USSR]

Drying of raw smoked sausage-type products in conditions of varying temp. and RH of air, and of drying in average-parameter air, was investigated. When the drying air is periodically altered to counter-current motion, a drying chamber containing an atmosphere with varying original parameters becomes identical over the whole working space of the box. The drying is thus performed in average parameters. If these parameters comply with the technological requirements, the adverse effect of air composition variations is offset and air consumption is reduced. STI

97

Home smoking and curing. [Book]

Erlandson, K.

118pp. ISBN 0-214-20322-0 (1977) [En]

London, UK; Barrie & Jenkins Ltd. Price £3.95

The book describes how to make the best use of meats in season, to prepare smoked salmon, cod, herring and other fish, pheasant, grouse, turkey, beef, pork, venison and many other kinds of meat and game, and how to make kilns for both cold and hot smoking cheaply and easily. Chapters include: The origins of smoke curing (pp. 4-5); Smoked fish and game in Scandinavia (pp. 6-8); The basic smoking process (pp. 9-11); The raw material (pp. 12-14); Pre-salting (pp. 15-22); Fuels (pp. 23-25); Equipment (pp. 26-48); Cold smoked products (pp. 49-69); Hot smoked products (pp. 70-96); Smoke roasting (pp. 97-102); Storage of smoked food (p. 103); and Commercial production (pp. 104-106). Appendices include a summary of smoking do's and dont's, brine strengths at 60° F, storage life of certain spp. of smoked fish, storage life of general types of smoked fish in deep freeze conditions, and RH of the atm in relation to smoke curing. AL

98

[Losses of solids in salted Kuril mackerel during cold smoking.]

Levanidov, I. P.; Konysheva, L. M.; Andreev, N. G.

Rybnoe Khozyaistvo No. 3, 66-68 (1978) [Ru] [TINRO, USSR]

2 methods of monitoring the solid losses (DM losses) are described for the pre-drying and smoking of Kuril mackerel; these are direct detn. of wt. of the dripping liquid during the named processes and detn. of its DM (without NaCl), or indirect detn. of losses by means of wt. differentials prior to and after the process. The former method is more accurate, as documented by experiments. The mean level of DM losses during steeping frozen salted mackerel before smoking was 0.65% of salted fish wt. STI

99

[Variations in the morphometric characteristics of Baltic sprat during hot smoking.]

Alymov, V. T.

Rybnoe Khozyaistvo No. 3, 69 (1978) [Ru] [Giprorybflot, USSR]

A total of 900 fish samples (fresh and smoked) was investigated for body length, max. thickness and height, vol. and wt. The smokehouse temp. was 140-150° C (cooking phase), 100° C (predrying) and 60-65° C (smoking). Hot smoking reduced all the parameters studied by (average) 3.35% (length), 5.15% (thickness), 5.77% (height), 32-72% (wt.) and 19-2% (vol.). Mathematical evaluation of experimental data produced empirical equations characterizing the dependence on dimensions of cold-smoked sprat. STI

100

[Fatty acids of smoked salmon.]

Renon, P.; Cantoni, C.; Comi, G.

Industrie Alimentari 17 (6) 509-514 (1978) [12 ref. It] [Istituto di Ispezione degli Alimenti di Origine Animale, Univ. degli Studi di Milano, Milan, Italy]

Gas chromatography with flame ionization (diethylene glycol succinate on Chromosorb P 60-80) was used to determine the fatty acid composition of the triglycerides of 3 smoked samples of each of the following spp. of salmon: Salmo salar (atlantic), Oncorhynchus tshawytscha (chiriook), O. kisutch (coho), O. keta (chum), O. nerka (sockeye) and O. gorbuscha (pink). Results are tabulated in detail. The % of polyunsaturated fatty acids in the fat was (for the order in which the spp. were quoted above), 75, 66, 71.7, 69.9, 70.8 and 69.5. Further tables give values obtained from the literature. HBr

101

[Distribution of temperature fields in tunnel-type smoking chambers.]
Stegalichev, Yu. G.; Golovkin, A. N.; Lazarev, V. L.
Rybnoe Khozyaistvo No. 3, 69-71 (1978) [Ru] [Leningradskii Tekh. Inst. Kholodil'noi Promyshlennosti, Leningrad, USSR]

The effect of internal parameters (air resistance of individual parts) on the structure of temp. field and the distribution of heat carrier currents in tunnel-type smoking chambers, specifically for fish, was studied. The change of resistance due to soiling of pallets has a marked effect on the temp. and current distribution, and may produce conditions that are the same as that caused by a change of the current of the heat carrier (nonhomogeneity of the product quality in relation to its location). STI

102

[Colour of meat products made with liquid smoke products.]
Hsu, L. A.; Sink, J. D.
Coletanea do Instituto de Tecnologia de Alimentos 8 (1) 271-277 (1977) [12 ref. Pt, en]

Frankfurters were (i) smoked conventionally, or treated with the liquid smoke preparation Charsol C-10 by (ii) spraying, (iii) dipping or (iv) incorporation of the liquid smoke in the emulsion. Control samples (v) were not smoked. Values for characteristics of (i), (ii), (iii), (iv) and (v) resp. were: concn. of phenols 0.18, 0.68, 1.72, 0.27 and 0.05 mg/100 g; colour (ratio of extinction values at 570 and 650 nm) 2.00, 1.91, 1.95, 2.03 and 2.08; flavour (points on a 9-point hedonic scale) 5.94, 5.98, 6.27, 5.43 and 5.26; and texture (shear force, kg) 1.80, 1.91, 1.99, 1.67 and 1.77. AJDW

103

[Reduction of content of polycyclic hydrocarbons in smoked meat products.] Verringerung des Gehaltes an polycyclischen Kohlenwasserstoffen in geräucherten Fleischwaren. [Review]
Potthast, K.; Eigner, G.; Eichner, R.
Berichte über Landwirtschaft 55 (4) 817-822 (1977, publ. 1978) [11 ref. De, en, fr] [Inst. für Chemie & Physik, Bundesanstalt für Fleischforschung, Oskar-von-Miller Strasse 20, 8650 Kulmbach, Federal Republic of Germany]

Data on contents of polycyclic aromatic hydrocarbons (PAH), especially 3,4-benzpyrene, in smokes for curing meat products are reviewed. PAH content of smoke increases with temp. of smoke production, and use of temp. as low as possible consistent with flavour production and preservative effect is recommended. Tabulated data show that cooling of curing smoke can reduce PAH content by 20-35% and washing of smoke gives reductions of 19-35%. PAH contents in tar and soot fractions show that very sooty curing smokes, especially those from black smoke powders, should be avoided, as large particles carry large amounts of PAH. Filtration of smoke can reduce contents of 3,4-benzpyrene, pyrene and fluoranthene by 91.4-97.5%. Further research needs to be done on PAH content of chemical smoking preparations (smoke condensates etc.) before decisions about their safety in comparison to curing smoke can be made.
DIH

104

[Smoking and cold storage.] [Lecture]
Krogh, G.
SIK Rapport No. 410, 73-82 (1976) [Sv] [Statens Livsmedelsverk, Uppsala, Sweden]

The potential hazard of growth and toxin formation by Clostridium botulinum in smoked fish is discussed with reference to: contamination of the raw material; hot- and cold-smoking, and their efficacy for elimination of clostridia; secondary contamination of smoked fish; factors tending to limit growth and toxin formation by Cl. botulinum in smoked fish (salting, altered pH, water activity and redox potential, inhibitory activity of smoke constituents, and presence of antagonistic organisms); and the need for low-temp. storage and transport to control growth of Cl. botulinum. [See FSTA (1978) 10 12C452.] AJDW

105

[Bacterial load on commercial smoked fish.] Bemerkungen zum Keimgehalt von im Handel befindlichen Räucherfischen.
Rakow, D.
Archiv für Lebensmittelhygiene 28 (5) 192-195 (1977) [11 ref. De, en] [Staatliches Veterinäramt, Bremerhaven F, Federal Republic of Germany]

158 samples of hot and cold smoked fish (231 single fishes) of various species were subjected to sensory and bacteriological examination (total aerobes, enterococci, salmonellae). 83 samples came from smoking houses and 75 from fish shops. Tabulated results showed higher total counts in cold-smoked fish and in samples from retail outlets; max. in smoking houses was 2 500 000/g in a cold smoked herring salmon, in fish shops 20 800 000/g in a hot-smoked black halibut. No salmonellae were detected, and no or only low levels (10^3/g) of enterococci except for 1 sample of mackerel fillet with 14 600 enterococci/g. No correlation was observed between sensory property and total aerobe count. The effects of smoking methods, protective action of the skin, gutting and composition of the flesh are discussed. RM

106

Study of smoking technique for chicken meat and preparation of sausages from dressed poultry.
Bhupal Singh; Khanna, J. M.; Khan, A. S.

Indian Journal of Animal Health 16 (2) 141-144 (1977) [2 ref. En] [Cent. Dairy Farm, Aligarh, Uttar Pradesh, India]

(i) culled laying hens of >52 wk age and (ii) broilers of 8-12 wk were slaughtered and dressed. They were cured for 24 h after injecting 2.0 ml pickle of salinometer reading 50° followed by smoking at 60-65° C for 2 h and cooking at 80° C for 2 h. Sausages prepared from separated minced meat were smoked for 5 h and cooked in water for 1½ h and organoleptically evaluated. Curing induced very little tenderization. Smoking and cooking did not improve the overall quality of (i), although some improvement was found in tenderness. Sausages prepared from (i) and (ii) had excellent flavour, taste and tenderness. This technique would convert the non-tender meat into delicious product; the costs are considered. CFTRI

107

Chemical effects of smoke-processing meats on product quality.
Hsu, L. A.
Dissertation Abstracts International, B 37 (7) 3332:Order No. 76-29646 (1977) [En] [Pennsylvania State Univ., University Park, Pennsylvania 16802, USA]

Frankfurters prepared using (i) conventional external smoking, (ii) smoke solutions in aerosol or liquid form externally applied or (iii) liquid smoke solutions internally applied were studied. Storage ability at 5° C was affected by treatment; free water content of (iii) and shear score of (i) decreased at faster rates than did these properties in other sausages. Juiciness, cured:total pigment ratio, pigment ring destruction, reflectance ratio, pH and thiobarbituric acid value were affected by time independently of smoking method; whereas product acceptability, sensory tenderness and flavour, extinction ratio, extent of pigment oxidation, free fatty acid content, total volatile N, product wt. and moisture content were not affected by 3 wk storage at 5° C. Except for (iii), phenol content of smoke appeared to be the factor affecting the traits examined. Product pH decreased with increase in phenol content. Possible mechanisms for the observed effects of smoking on various traits are discussed. Smoking as in (i) or (ii) improved product flavour as compared to unsmoked controls, but overall acceptability was not improved by (i)-(iii), and (iii) gave the least liked product. Increasing smoke concn. on product surface gave lower nitrite content, darker colour, greater pigment degradation and higher shear score. (i) had weakest effect on product quality, (ii) as aerosol was similar to (i), and (ii) as a dip had the most pronounced effect on product quality. DIH

108

[Smoked meat products. General requirements.]
Hungary, Magyar Szabvanyugyi Hivatal
Hungarian Standard **MSZ 19423-76**, 6pp. (1976) [Hu]

109

[Sausage products. Smoked and cooked sausages. General requirements.]
Hungary, Magyar Szabvanyugyi Hivatal
Hungarian Standard **MSZ 5857/1-77**, 5pp. (1977) [Hu]

110

[Sausage products. Raw smoked sausages. General requirements.]
Hungary, Magyar Szabvanyugyi Hivatal
Hungarian Standard **MSZ 5857/2-77**, 6pp. (1977) [Hu]

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H. BROOKES

EDITOR

1

Smoke flavor impartation.
Orsing, J. H.
United States Patent 4 095 957 (1978) [En]

A fuel element for grilling foods and imparting a smoked flavour therto, comprises a porous, noncombustible glass fibre casing containing a combustible fuel. IFT

2

Nylon in packaging.
Matinini, R.
Packaging 49 (582) 29–31, 35 (1978) [En]

The major physical properties of 2 new nylon films (Filmon CS and BX) are tabulated in detail. Their high barrier properties make them particularly suited for the packaging of frozen foods, boil-in-bag foods, cheese blocks, cooked and fresh meats, roasted peanuts, smoked fish and coffee. HBr

3

Simple methods for extending the shelf life of soy curd (tofu) in tropical areas.
Pontecorvo, A. J.; Bourne, M. C.
Journal of Food Science 43 (3) 969–972 (1978) [16 ref. En] [New York State Agric. Exp. Sta., Cornell Univ., Geneva, New York 14456, USA]

Simple methods of preservation are described for extending the shelf life of soy curd (tofu) in rural tropical areas, using available natural resources and appropriate technology. Soy milk made by the boiling water grind method was coagulated with lemon juice to make tofu. Methods studied for extending the storage stability included immersion in aqueous solutions, smoking, and combinations of the above. Changes in acceptability, composition and bacterial load during storage for 5 and 10 days at 24° and 37° C were measured. The shelf life was successfully extended to 10–15 days without refrigeration by smoking and also by storing in salt brines acidified with lemon juice. IFT

4

[Fish processing.]
Ohtake, S.
Japanese Patent 5 312 585 (1978) [Ja]

The flavour and odour of processed fish are improved by immersion in an ion exchange solution prior to smoking or drying. IFT

5

Apparatus for producing smoke.
Stewart, T. F.
British Patent 1 503 654 (1978) [En]

Smoke producing apparatus for e.g. a fish smoking kiln includes an apertured turntable onto which combustible material is fed. IFT

6

[Smoked, jerked and dried fish.] Kopchenaya, vyalenaya i sushenaya ryba. [Book]
Khvan, E. A.; Gudovich, A. V.
207 pp. (1978) [156 ref. Ru] Moscow, USSR; Pishchevaya Promyshlennost'.

Theoretical principles and present technology are discussed in the book. The following chapters are included: Fish as raw material for the production of smoked and dried products (pp. 5–17); Treatment of fish prior to smoking and dehydration (pp. 17–43); Fish smoking (pp. 43–146); Drying and jerking of fish (pp. 147–181); Packaging and storage of smoked and dried fish products (pp. 181–190); and Sanitation and hygiene (pp. 190–200). STI

7

Effects of initial ham quality and other variables on processing yield and smoke deposition.
Korhonen, R. W.; Reagan, J. O.; Carpenter, J. A.; Campion, D. R.; Stribling, K. V.
Journal of Food Science 43 (3) 856–859 (1978) [16 ref. En] [Dep. of Food Sci., Univ. of Georgia, Athens, Georgia 30602, USA]

Subjective ratings for muscle colour and firmness were utilized to segment 299 fresh hams into 4 different quality groups (low, average, high, dark and soft). Individual hams were pumped to 115% of their green wt. with a 62° salinity brine by either an artery (188 hams) or stitch (111 hams) brine injection system and then held at 3° C for a 21-day brine equalization period. The hams were then washed, placed in stockinettes and smoked. Prior to smoking, individual hams were assigned to 1 of 6 smoking schedules which were based upon 3 different levels of RH (40, 60 and 80%) and 2 heating schedules (60, 71, 82° C or 49, 60, 71° C, dry bulb). Centre-cut slices (1.25 cm thick) were removed from 5 or 6 average quality hams in each smoking schedule. Three 0.3-cm thick slices were removed from the top (medial side) and two 0.3-cm thick slices from the bottom (lateral side) of each centre-cut slice for smoke deposition detn. (phenolic compounds). Artery-pumped hams produced significantly higher processing yields than the stich-pumped hams. Smoke deposition was not affected by method of brine injection. Processing yields were significantly lower for the low-quality group of hams. Smoking schedules employing the lower smokehouse temp. and RH (40 and 60%) produced higher overall processing yields. At the higher temp. schedule, 60% RH decidedly reduced overall processing yields. Processors desiring to use higher smokehouse temp. should use an RH greater than or less than, but not equal to, 60% to optimize processing yields. The concn. of phenols observed in all 6 treatments would result in acceptable smoke flavour ratings. IFT

8

[Development and manufacture of continuous tunnel smoking installations.]
Polach, P.
Prumysl Potravin 29 (3) 149–151 (1978) [Cs, ru, en, de] [Vzduchotech., n.p., Nove Mesto nad Vahom, Czechoslovakia]

Aktua smoking installations have been produced for 8 yr in the factory named in the address. The latest version incorporating numerous improvements is described and diagrammatically illustrated. It consists of

10 units, each carrying the product being smoked and capable of turning in pairs at 180° to each other about a vertical axis creating the desired smoke and heating steam flows. Construction is of stainless steel, bearings are permanently lubricated and heating is proportionally controlled. Throughput is 8000–10 000 kg sausage, 5000–6000 kg 'Paris' salami and 6000–6700 kg 'Gotha' salami/8-h shift. Projected developments are outlined. SKK

9

[Yield and some properties of meat of bullocks of the Hereford breed.]
Vrchlabsky, J.; Kudelkova, K.; Machalek, J.
Zpravodaj Masneho Prumyslu No. 1, 53–60 (1978) [Cs] [Vyzkumny Ustav Masneho Prumyslu, Brno, Czechoslovakia]

37 bullocks of the Hereford breed were evaluated; their average wt. was 372 kg, the wt. of warm carcass was 208 kg. Compared with the standard, the tested animals yielded more hides and lard. By means of laboratory and sensory tests, the typical so called dark firm dry and possibly dark cutting conditions were identified, i.e. dark colour, high pH, excellent capacity to bind water, tender consistency; the flavour was somewhat flat. The quality of the carcasses was found to be average, suitable for the manufacture of smoked meat products. From the consumers' point of view, the meat is suitable for the preparation of quickly-cooked meat dishes. STI

10

Beef: dried, chilled or frozen.
United States of America, General Services Administration, Federal Supply Service
Federal Specification **PP-B-211F,** 23pp. (1977) [En] [Washington, DC 20406, USA]

This specification, which supersedes **PP-B-211E** (1971), deals with beef, cured, smoked (if specified) and dried, either sliced or unsliced. It covers requirements for materials, processing and finished product, testing of packaging components and product characteristics, packaging, etc. AL

11

[Smoked bacon sausages.]
Czechoslovakia, Urad pro Normalizaci a Mereni
Czechoslovak Standard **CSN 57 7115,** 2pp. (1977) [Cs]

The sausages shall contain $\leq 52\%$ moisture, $\leq 42\%$ fat and 2.2 ± 0.6% salt. HBr

12

[Formaldehyde catalysis of nitrosation.]
Raya, K. K.; Kann, Yu. M.
Tallinna Polütehnilise Instituudi Toimetised No. 402, 71–75 (1976) [12 ref. Ru, en]

Laboratory experiments were carried out on formation of nitrosomorpholine from $NaNO_2$ and morpholine at 25°, 37° or 45° C in the presence or absence of various proportions of formaldehyde. Formaldehyde catalysed the reaction, particularly at high temp. It is considered that the findings have a bearing on formation of carcinogenic nitrosamines in foods, i.e. the presence of formaldehyde in smoke used for food smoking, or in marine fish intended for processing in which formaldehyde is formed from trimethylamine oxide during refrigerated storage. SKK

13

[Oxidation of nitric oxide using potassium permanganate.]
Kann, Yu. M.; Kalve, R. E.; Kass, A. Kh.
Tallinna Polütehnilise Instituudi Toimetised No. 402, 65–69 (1976) [8 ref. Ru, en]

With the aim of reducing the NO content of smoke used in food smoking (capable of giving rise to contamination with carcinogenic nitrosamines), oxidation of NO to NO_2 by potassium permanganate was studied in laboratory experiments. At NO concn. of 2.5–25 mg/m^3, extent of oxidation was 80–95%. SKK

14

Suitability of enzyme treatment and ammonium sulfate precipitation method for detection of staphylococcal enterotoxin from different foods.
Niskanen, A.; Lindroth, S.
European Journal of Applied Microbiology 4 (3) 233–237 (1977) [11 ref. En] [Food Res. Lab., Tech. Res. Cent. of Finland, Biologinkuja 1, SF-02150 Espoo 15, Finland]

An enzyme treatment and $(NH_4)_2SO_4$ precipitation procedure was adapted to the detection of staphylococcal enterotoxin from high-protein foods. The enterotoxin is extracted from food with distilled water, soluble proteins are acid-precipitated (pH 4.5) and the supernatant washed with chloroform (pH 7.5). The extract is treated with trypsin and Pseudomonas peptidase for 2 h at 37° C. Residual unhydrolysed material is precipitated with 60% $(NH_4)_2SO_4$ for 15 min at 4° C. The precipitate is redissolved in phosphate buffer and concentrated by dialysis against polyethyleneglycol. The concentrate is washed with chloroform and lyophilized. The dry material is dissolved in 0.2 ml distilled water and enterotoxin detected by the micro-slide method with 24 h incubation at 37° C. Using this method, it was possible within 3 days to detect 0.2–1.0 µg staphylococcal enterotoxin A added to minced meat, dry sausage, smoked fish, cheese and milk. AS

15

[Effect of cooking and smoking methods on the quality of textured products.]
Golovanev, V. F.; Bol'shakov, A. S.
Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 3, 71–74 (1978) [4 ref. Ru] [Yaltinskii Myasopererabatyvayushchii Zavod, Yalta, USSR]

The effect of electro-contact heating and of smoking preparations VNIIMP and Vachtol on the quality of smoked meat products was investigated. The electro-contact heating resulted in more intense cooking process, but at high rates ($98-129 \times 10^{-3}$ °C/s) unsatisfactory cooking of collagen was observed, as well as a deterioration in organoleptic properties, binding capacity and juiciness. These drawbacks were eliminated when slow 2-stage electro-contact heating was applied; the process was 5-6 × more intense, wt. losses and losses of proteins, fats and vitamins were reduced, and the digestibility of proteins was improved. The addition of 0.15% of either smoking preparation improved the organoleptic properties of salamis and also inhibited development of microorganisms and oxidation processes. STI

16

[Dependence on relative humidity of air in drying chambers of weight changes in smoked sausages.]
Shazzo, R. I.; Mayakovskii, Yu. V.; Nedil'ko, V. D.; Kargal'tsev, I. I.; Slepykh, G. M.
Kholodil'naya Tekhnika No. 6, 33-35 (1978) [2 ref. Ru] [Severo-Kavkazskoe Otdelenie VNIKhI, USSR]

Drying of smoked products is carried out under isothermal conditions at 12° C, with changing RH of the air. The dependence of relative loss of wt. of smoked products on drying time is presented, in relation to RH of air in the chamber. The experimentally-established dependence is in close correlation with the calculated dependence. The linear dependence between the RH of air in the drying chamber and wt. losses of the products may serve for the programming of microclimate control. STI

17

[Method of producing wet-smoked sausages.]
Krylova, V. V.; Likhonosova, N. D.; Mikhailova, M. M.; Mirzoeva, V. Sh.; Belova, V. Yu.; Chistyakova, T. G.; Anisimova, I. G.; Krasnova, N. A.; Chumakova, T. N.
(Union of Soviet Socialist Republics, Vsesoyuznyi Nauchno-issledovatel'skii Institut Myasnoi Promyshlennosti)
USSR Patent 592 402 (1978) [Ru]

Starting material is processed to obtain a force-meat, and the sausages are smoked in 3 stages and dried in 2 stages. 1st-stage smoking is at 15-25° C and 90-95% RH for 10-24 h, 2nd stage at 20-24° C and 85-90% RH for 40-48 h, and 3rd stage at 18-20° C and 80-85% RH for 30-36 h. Drying is preferably 1st at 12-18° C and 80-90% RH for 3-5 days, then at 11-13° C and 70-80% RH for 15-20 days. A 2:1 mixture of lactic acid and denitrifying microorganisms is preferably added to the filling at 50 g/100 kg filling. W&Co

18

[Changes in contents of coliform and Proteus bacteria during ripening of long-keeping raw meat products.]
Iordanov, I.; Delchev, Kh.
Veterinarnomeditsinski Nauki 14 (9) 52-58 (1977) [6 ref. Bg, ru, en] [Tsentralen Nauchnoizsled. VetMed. Inst., Sofia, Bulgaria]

Samples of numerous varieties of raw dried smoked or non-smoked sausages (Lukanka, salami, sudzhuk types), either contaminated after casing of sausage meat by injection of Escherichia coli or Proteus bacteria cultures, or made normally were manufactured in several factories and examined after 15, 27, 38 and 45 days of drying and ripening, the moisture content and coliform and Proteus titres being determined. Results are tabulated and graphically presented. In general, coliform and Proteus contents declined progressively as ripening proceeded, smoking having no marked effect. In finished products of moisture content complying with the Bulgarian Standard requirements, coliforms were detected in 43% of samples, but Proteus was not detected. SKK

19

[Method for heat treatment of sausages.]
Berezenko, A. M.; Gorodiskaya, V. D.; Yavorskii, M. I.; Galushchenko, V. A.; Zhirnyi, P. A.; Samulyzhko, M. K.
(Union of Soviet Socialist Republics, Ukrainskii Nauchno-issledovatel'skii Institut Myasnoi i Molochnoi Promyshlennosti)
USSR Patent 599 786 (1978) [Ru]

To improve product quality and reduce process time, sausages are heated at 20-25° C and 65-75% RH for 6-12 h until the temp. in the centre is 15-20° C. The surface is then dried, and the sausages are treated with a smoke preparation at 60-70° C for 10-15 min, and cooled in dryers at 2-4° C and 85-95% RH for 12-24 h. W&Co

20

Liquid smoke composition.
Shin-Gee Chiu, H. (Union Carbide Corp.)
United States Patent 4 104 408 (1978) [En]

Aqueous liquid smoke compositions containing a water-soluble alcohol solubilizing agent to prevent smoke constituents from separating out is described. IFT

21

[Contamination by lead and cadmium during smoke drying of cereals.] Untersuchungen zur Blei- und Cadmiumkontamination bei der Rauchgastrocknung von Getreide.
Woggon, H.; Malkus, Z.
Nahrung 22 (7) 647-654 (1978) [6 ref. De, en, ru] [Zentralinst. für Ernährung, Potsdam-Rehbrücke, German Democratic Republic]

Studies were conducted on effects of direct drying of oats, rye and wheat with combustion gases (using diesel oil as the fuel) on the Cd and Pb contents of the grain. 11 cereal samples were studied. Pb and Cd concn. were determined by direct inverse polarography, indirect inverse polarography (after dithizone extraction) or AAS; recovery data are given, and the relative merits of the analytical techniques are considered. Block diagrams are given showing Cd and Pb concn. before drying and after drying once or twice. The results show that direct drying using combustion gases generally had little effect on Cd or Hg concn. in grain. Cd concn. in all samples was well below the tolerance limit (0.10 mg/kg in the DM). 2 samples exceeded the tolerance limit for Pb (0.5 mg/kg in the DM); however, these samples had high Pb concn. before drying. It is concluded that this drying method gives little danger of contamination with heavy metals; however, there may be a risk of contamination with carcinogenic hydrocarbons. IN

22

They're smoking small in Peru.
Anon.
Fishing News International 17 (11) 43 (1978) [En]

Cerala SCRL, a small cottage industry fish-smoking enterprise near Villa Beach, Peru, processes swordfish and Spanish mackerel (sierra) and is testing lower-priced horse mackerel and jack mackerel. The enterprise produces 200-250 kg smoked fish a month, but has the capacity for 3 t. The kiln is built of white bricks, is lined inside with cement and is heated by a log fire to 120° C. Logs are usually algarrobe from N. Peru, which were found to be the nearest to the oak used in Britain. AL

23

Estimation of histamine in fish and fish products in the light of the food regulations.
Wurziger, J.; Dickhaut, G.
Fleischwirtschaft 58 (6) 963-964; 989-994 (1978) [11 ref. En, de] [Chem. & Lebensmitteluntersuchungs-Anstalt der Freien & Hansestadt Hamburg, Gorch-Fock-Wall 15-17, 2000 Hamburg 36, Federal Republic of Germany]

Following some reports of food poisoning attributed to consumption of mackerel and tuna fish with no sensory or bacteriological defects, the histamine concn. in fresh, frozen, smoked and canned samples was investigated. Tabulated results showed up to 300 p.p.m. histamine in fresh and smoked samples, especially from dark meat. As none of the samples were affected by bacterial decay, the histamine was obviously derived from decarboxylation of free histidine in the fish blood by endogenous enzymes. Since small quantities of histamine cannot be completely avoided in dark-fleshed fish, careful removal of the blood as soon as possible after catching mackerel and tuna fish is recommended. Canned tuna showed slight sensory defects at concn. >50 p.p.m. histamine (max. concn. found 80 p.p.m.), suggesting that canned products should be examined at the slightest fault in smell or taste. Semi-quantitative TLC is a convenient and sufficiently sensitive method. RM

24

[The occurrence of 3,4-benzpyrene in smoked meat products, seasonings and other foods.] Über das Vorkommen von 3,4-Benzpyren in geräucherten Fleischerzeugnissen, Gewürzen und anderen Lebensmitteln.
Potthast, K.
Fleischerei 29 (5) 67-70 (1978) [De] [Bundesanstalt für Fleischforschung, Oskar-von-Miller-Strasse 20, D-8650 Kulmbach, Federal Republic of Germany]

The significance of the presence of 3,4-benzpyrene (3,4-Bp) and other carcinogenic polycylic aromatic hydrocarbons in foods is discussed. Tables of data are given for levels of 3,4-Bp in meat products smoked by various methods, and in various herbs, spices and other foods of plant origin. The results show that smoke generation from smouldering wood gave much higher 3,4-Bp concn. (≤36.23 parts/billion, p.p.b.) than steam- or friction-generation. (≤0.77 and ≤4.56 p.p.b., resp.). The 3,4-Bp content of meat products tended to increase with increasing degree of smoking. Methods for elimination of 3,4-Bp from smoke are discussed. Data for herbs and spices show that leaf-type herbs and fruit-type spices had the highest 3,4-Bp concn. (≤9.73 and ≤15.9 p.p.b. resp.); this is attributed to the large surface area of leafy herbs, and the presence of essential oils (in which 3,4-Bp may dissolve) in fruit-type spices. Of the other foods of vegetable origin, leafy vegetables had the highest 3,4-Bp concn. (≤50 p.p.b.). AJDW

25

[Determination of phosphorus in meat products. I. Method of determination.]
Graner, C. A. F.; Meira, D. R.; Mucciolo, P.
Revista do Instituto Adolfo Lutz 35/36, 55-62 (1975/1976) [18 ref. Pt, en] [Fac. de Ciencias Med. & Biol. de Botucatu, Brazil]

A fast, simple and accurate method is proposed for detn. of P in meat products by formation of phosphovanadomolybdic acid, according to Boltz & Lueck [New York Interscience Publishers 1958]. Analysis of Frankfurter-type sausages, Mortadella, ham, smoked ham and roast beef gave recoveries of 99.0-108.0% from 40 µg, 97.9-102.6% from 80 µg additions, and good agreement with results obtained by the Official Method of the Instituto Adolfo Lutz (no significant differences at the 5% level, t test). Results from the 5 products were 0.33, 0.54, 0.76, 1.07 and 0.43% P, or 0.76, 1.24, 1.74, 2.45 and 0.98% P_2O_5, or 1.01, 1.65, 2.33, 3.28 and 1.32% PO_4^{3-}, resp., showing that all exceeded the legal 0.5% max. for polyphosphate. RM

26

[Hygienic aspects of the application of smoke preparations in the production of meat products.] [Review]
Karplyuk, I. A.; Gogol', A. T.
Voprosy Pitaniya No. 5, 16-19 (1978) [42 ref. Ru] [Tsentral'nyi Inst. Usovershenstvovaniya Vrachei, Moscow, USSR]

Part of this review includes an analysis of 3 Soviet smoke preparations (VNIIMP, VAKhTOL' and MINKh) currently in use for smoking meat products. The analysis covers phenols, carbonyl compounds, furfurol, acids, compound esters, methyl alcohol and non-volatiles. It is concluded that smoke preparations are not without effect on the body, and therefore should be authorized only as a substitute for direct smoking of food products, and only after protracted toxicological and hygienic tests. HBr

27

[Cold-smoked fish.]
Bulgaria, D"rzhaven Komitet za Standartizatsiya
Bulgarian Standard BDS 4128-77, 8pp. (1977) [Bg]

This standard, which supersedes BDS 4128-72, applies to 2 quality grades of mackerel, herrings, alewife, grey mullet, tuna, mackerel, carp, bighead, besugo, bluefish and Nototenia, smoked at ≤40° C. Specific requirements include for 1st and 2nd grade resp.: salt content, 5-10 and 5-12%; moisture, 45-58 and 40-60%; and total fat, ≥8% in both. The smoked fish shall be stored at 2-15° C, and transported at 2-15° C; shelf life is 30 days. HBr

28

[Planning and evaluation of collaborative tests for determination of repeatability and reproducibility.] Planung und Auswertung von Ringversuchen zur Ermittlung der Wiederholbarkeit und Vergleichbarkeit.
Waibel, J.
Fette Seifen Anstrichmittel 80 (10) 410–413 (1978) [1 ref. De, en] [Unilever Forschungsgesellschaft mbH, 2000 Hamburg 50, Federal Republic of Germany]

Rules are outlined for planning collaborative studies so as to determine the repeatability and reproducibility of analytical results (including the required number of participants and analyses), and a simple method is described for their calculation. The method operates without assuming normal distribution. It is illustrated by an example, i.e. detn. of the smoke point of a fat. RM

29

Curing and smoking poultry products.
Mast, M. G.
World's Poultry Science Journal 34 (2) 107–111 (1978) [6 ref. En] [Coll. of Agric. Extension Service, Pennsylvania State Univ., University Park, Pennsylvania, USA]

Curing processes in general are briefly described, and methods and recipes for the preparation of cured/smoked poultry products are given. Brine curing should take place at ≤40° F, after which birds should be washed throughly and dried. Smoking time and temp. are variable, depending on the degree of smoked flavour desired, but an internal temp. of ≥155° F must be achieved for ready-to-eat products; the cooking process may be finished in a conventional oven. Hickory, apple, peach, maple, plum or ash woods may be used to produce the smoke; any non-resinous wood is suitable. Products must be refrigerated, giving a shelf-life of ≤2 wk; longer periods should involve frozen storage at 0° F (≤4 months before deterioration of flavour takes place). JRR

30

Separation of non-dye components of Brown FK by high-performance liquid chromatography.
Jones, A. D.; Hoar, D.; Sellings, S. G.
Journal of Chromatography 166 (2) 619–622 (1978) [3 ref. En] [Unilever Res., Colworth House, Sharnbrook, Beds., UK]

A high-performance liquid chromatographic (HPLC) system is described for the separation and quantitation of the non-dye components in Brown FK (a permitted food colour which is particularly suitable for colouring kippers). HPLC, using an octadecyl column, was suitable not only for analysing the low levels of sulphanilic acid and aromatic amines in commercial Brown FK samples but also resolved the 6 dye components. A previously reported TLC system [see Food and Cosmetics Toxicology (1967) 5,1] separates all 6 dye components but the other organic compounds are not well resolved. AL

31

[Importance of smoked fish.] Die Bedeutung des Räucherfisches.
Schwarz, I.
Ernährungs-Umschau 24 (4) B17–B20; (5) B24 (1977) [10 ref. De] [Fischwirtschaftliches Marketing-Inst., 2850 Bremerhaven 1, Federal Republic of Germany]

In this illustrated article, the author describes the preparation of smoked fish, lists the popular var. of smoked fish, quotes their production and consumption figures in Federal Germany, presents data on energy, protein and fat contents of most frequently purchased 100-g packs of 11 var. and of 125-g and 150-g packs of 2 var., and gives 5 recipes for smoked fish dishes in a 1500-kcal/day diet, and 5 recipes for hot and cold smoked fish dishes in a normal diet. SKK

32

[General purpose chamber for thermal processing cold-smoked salami.]
Larikhin, V. N.
Myasnaya Industriya SSSR No. 4, 38–39 (1978) [Ru] [Leningradskoe SKB Ob"edinenie Rosmyasomolremproekt, Leningrad, USSSR]

Equipment for air conditioning in an experimental general purpose chamber for raw salami ripening, in operation at the meat processing plant in Orel, is described. The equipment is illustrated by means of a diagram. The output of the air conditioner is 13 000 m^3 air/h. STI

33

[Small cold-smoked fish. Quality requirements for certificated products.]
Union of Soviet Socialist Republics, Gosudarstvennyi Komitet Standartov
Soviet Standard **GOST 5.2310-77,** 5pp. (1977) [Ru]

This standard applies to sprats, capelin herrings and Black Sea scad ≤21 cm long, and Black Sea sprat. It covers general quality requirements (shape, size, colour etc.), packaging (wooden crates, cartonboard or plastics packs) and storage (≤15 days at 0° to −2° C, or ≤3 days at 5–18° C). KME

34

[Cold-smoked Far Eastern salmon products. Quality requirements for certificated products.]
Union of Soviet Socialist Republics, Gosudarstvennyi Komitet Standartov
Soviet Standard **GOST 5.2314-77,** 5pp. (1977) [Ru]

This standard applies to cold-smoked products from 6 types of Far Eastern salmon. They shall contain ≤7 wt.% cooking salt and 52–58 wt.% moisture. The standard also covers packaging (cartons, plastics containers, slatted crates, corrugated board cases) and storage (0° to −8° C). KME

35

[Cold smoked herring. Quality requirements for certificated products.]
Union of Soviet Socialist Republics, Gosudarstvennyi Komitet Standartov

Soviet Standard **GOST 5.2318-78, 4pp. (1978) [Ru]**

This standard applies to cold smoked Pacific and Atlantic herring ≥ 20 cm long, and awarded the State Quality Grade. Salt content shall be 5–10 wt.% and moisture content ≤ 60 wt.%. The standard also covers packaging (cartonboard or plastics containers, slatted wooden boxes or corrugated board crates), transport (−5° to 0° C) and storage (−5° to 0° C). KME

36

Improvements in or relating to smoke boxes.
Benshine Smokers
British Patent 1 522 451 (1978) [En]

A portable box is described, for smoking and cooking raw foodstuffs, which has a smoking and cooking compartment with a separate tray for smoke forming materials, e.g. oak shavings, and an electric heating element beneath the tray. The process retains the natural colour of the food. IFT

37

[Technology of common smoking methods.] Die Technik gebräuchlicher Räucherverfahren.
Klettner, P.-G.
Fleischerei 29 (10) 60, 63–64, IX–X (1978) [9 ref. De, en, fr, es] [Bundesanstalt für Fleischforschung, D-8650 Kulmbach, Federal Republic of Germany]

Smoking methods for meat products are discussed, with reference to: purposes and effects of smoking; smoke temp. (for cold-, warm-, hot- and black-smoking); smoke generation temp., and its effect on the composition of the smoke (especially the concn. of carcinogenic polycyclic aromatic hydrocarbons); smoke generation methods (smouldering, steam treatment methods, friction, fluidized-bed heating, 2-stage smoke generation); uptake of 3,4-benzpyrene and other carcinogens by meat products during smoking; and 3,4-benzpyrene levels in other foods. AJDW

38

[Gas appliances for meat-processing and smoking equipment.] Gasverbrauchseinrichtungen für Fleischerei und Räucheranlagen.
Germany, Federal Republic of, Deutscher Normenausschuss
German Federal Republic Standard **DIN 3378, 11pp. (1978) [De]**

39

[A survey of food contamination by 3,4-benzpyrene. II. Smoked foods.]
Bories, G.; Tchimbakala, A.; Tchimbakala, E.
Annales de la Nutrition et de l'Alimentation 32 (4) 811–817 (1978) [12 ref. Fr, en] [INRA, Lab. de Recherches sur les Additifs Alimentaires, 180 Chemin de Tournefeuille, 31300 Toulouse, France]

The method described [see part I, preceding abstr.] was applied to a large number of commercial smoked products. Tabulated results show contents of < 1 part/billion in most cases, except for anchovies with 6.8 and 7.0. Investigations of the effect of smoking procedures showed that low-temp. smoking (≥ 12 h at 20°C to 1 h at 50–65°C) did not produce benzpyrene concn. > 0.5 μg/kg. The high concn. in anchovies could not be attributed to commercial liquid smoke extracts and might be due to environmental contamination. RM

40

Canning of smoked dhoma (Sciaenid sp.).
Varma, P. R. G.; Venkataraman, R.
Fishery Technology 15 (1) 27–29 (1978) [4 ref. En] [Veraval Res. Cent. of Cent. Inst. of Fisheries Tech., Veraval-362 265, Gujarat, India]

Process for making a wholesome smoked and canned product from dhoma (Sciaenidae) is described. Dressed dhoma is cold blanched in 15% brine containing 0.5% potash alum and 0.2% citric acid, and smoked for 120 min (duration tested 60–180 min) at 45 ± 5°C. The smoked fish after filling into cans is precooked at 0.35 kg/cm^2 steam pressure for 50 min (duration tested 20–60 min), cans are filled with hot refined groundnut oil, sealed, and processed for 60 min (duration tested 30–60 min) at 0.7 kg/cm^2 steam pressure. CFTRI

41

[Production of concentrated bacterial cultures for raw smoked sausages.]
Rei, M. K.; Kirikall, V. V.; Teemusk, A.-R. E.
Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 3, 75–78 (1978) [5 ref. Ru] [Estonskaya Sel'skokhozyaistvennaya Akad., USSR]

The possibility of use of Streptococcus diacetilactis 6067 and Lactobacillus plantarum 22 starters was studied using conc. media allowing achievement of counts of 10^9 to 10^{10} cells/ml. It was established that these counts could be achieved when the above strains were cultured using media containing dried skim-milk, sterile plasmolysate of yeasts, malt extract and minerals (the composition of the media used is given). The starters had to be neutralized by means of NH_4OH solution for 26 h and repeatedly cultured for 18 h. The conc. starters were successfully stored for < 1 month at 4°C. STI

42

[Method of preparation of seasoned smoked sausage and raw meat.] Verfahren zur Herstellung von räucherwürzigen Rohwürsten und Rohfleischwaren.
Henning, W.
German Federal Republic Patent Application 2 716 245 (1978) [De]

The time of smoking of raw sausage and meats can be substantially reduced by first injecting the meat with a made-up solution of smoke by means of an ordinary brine injector. Water-soluble smoke seasoning, freed from insoluble tars, is dissolved in water and injected in an amount of 1.5–2.5% of the wt. of the flesh. The smoke seasoning is such that 1.5–2.5% in a 1% solution of cooking salt has the flavour of well-smoked food. The products are air-dried after injection and before the short smoking operation. W&Co

43

A comparison of five cure procedures for smoked turkeys.
Wisniewski, G. D.; Mauer, A. J.
Journal of Food Science 44 (1) 130–133 (1979) [26 ref. En] [Dep. of Poultry Sci., Univ. of Wisconsin, Madison, Wisconsin 53706, USA]

4 methods of curing-smoking turkeys were compared to a conventional brine-smoked turkey process for their effects on product yield, salt and moisture levels, pH, colour, shelf life, and sensory attributes. Dry curing followed by smokehouse cooking provided a moist acceptable product. Liquid smoke brining for smoked turkey was not as well received. Treatments of dry curing plus smoking and conventional brining plus roasting resulted in low bacterial counts and high TBA values; conventional brining plus roasting provided a less desirable external appearance. Based on TBA values and desirability, a brine-smoke combination seems likely to give the most acceptable product. IFT

44

Smoke flavoring.
Juhn, H.; Wistreich, H. E. (B. Heller & Co.)
United States Patent 4 118 519 (1978) [En]

Process is described in which an aqueous liquid smoke composition is contacted with an edible oil (e.g. soybean, corn, olive, coconut, palm, groundnut, mineral oil, lard) having dissolved therein a fatty glyceride, whereby smoke flavouring ingredients are extracted to yield an oily phase flavouring composition. IFT

45

Smoking technology for the 80s.
Anon.
International Flavours and Food Additives 9 (6) 265–266 (1978) [En]

Consideration is given to the following aspects of smoking technology: difficulties of smoking (the smoke contains polycyclic aromatic hydrocarbons which are known to be powerful carcinogens and this has implications for the smoked product and for environmental pollution by emission into the atmosphere); range of smoke extracts; means of applications; and application techniques. VJG

46

[Yugoslav equipment for heat processing of semi-dry sausages and smoked meat products.]
Sambolec, S.
Tehnologija Mesa 19 (6) 180–184 (1978) [6 ref. Sh, en] [TOZD Mesarija, Kocevje, Yugoslavia]

The machinery works in Knezevo manufacture the all-purpose smoking unit TDK-4, used for heat-processing of sausages and smoked meat products. The fully-automated smoke generator, type DG-540, is electrically heated. The smoke passes through a water filter. Hot air fed into the smoking equipment is circulated and discharged. When steam is used, it is fed into the equipment at a pressure of 150 kPa by means of an electro-magnetic valve. The heat-processing of frankfurters and bacon is described in detail. STI

47

[Decomposition of ribonucleotides during curing.]
Untersuchungen über das Abbauverhalten der Ribonucleotide im Pökelprozess.
Platz, S.; Gissel, C.; Wenzel, S.
Archiv für Lebensmittelhygiene 29 (6) 225–228 (1978) [14 ref. De, en] [Bundesforschungsanstalt für Landwirtschaft, Celle, Federal Republic of Germany]

The application of hypoxanthine content as a parameter for hygienic evaluation of cured meat products was investigated. Samples of ham on the bone from a meat processing plant were analysed for pH, adenosine diphosphate (ADP), inosine monophosphate (IMP), hypoxanthine (HYP) and salts (NaCl, NO_2^- and NO_3^-) during processing (after curing, 'burning' and smoking). The following results were obtained: for surface samples, highly significant negative correlation of ADP and IMP concn. with stage of production; traces of ADP but no IMP in the finished product; highly significant positive correlations of HYP concn. and pH with stage of production (though rises were much smaller than in aged fresh meat); for samples from various depths (1–12 cm), highly significant positive correlations between depth and HYP concn. at all stages; significant correlation between depth and ADP concn.; after smoking, highly significant correlations at the other 2 stages of processing; negative correlation of IMP concn. and depth after burning; negative highly significant correlation between depth and concn. of curing salts (except for $NaNO_2$ after smoking); and increasing pH from the surface inwards, not analysed statistically. There was no relation between HYP concn. and organoleptic state, precluding its use for quality evaluation. RM

48

Changes in the microbial flora of smoked chicken during storage.
Oblinger, J. L.; Koo, L. C.; Koburger, J. A.; Janky, D. M.
Poultry Science 57 (1) 123–126 (1978) [7 ref. En] [Food Sci. & Poult Sci. Dep., Univ. of Florida, Gainesville, Florida 32611, USA]

Smoked broiler halves were stored at 25, 15 or 5°C for ≤28 days. Samples were analysed for total aerobic plate counts, yeasts and moulds, coliforms, % salt and phenolic content. At 25°C, a mixed microbial flora was evident with visible mould growth. At 5 and 15°C, yeasts and moulds predominated. The major source of contamination was believed to be the sawdust. No coliforms were found in the smoked product regardless of storage temp. Salt penetration was rapid throughout chicken muscle whereas the major concn. of phenols was located on the skin. AS

49

The effect of salt concentration and brining time on organoleptic characteristics of smoked broiler hens.
Janky, D. M.; Oblinger, J. L.; Koburger, J. A.
Poultry Science 57 (1) 116–118 (1978) [5 ref. En] [Florida Agric. Exp. Sta., Univ. of Florida, Gainesville, Florida 32611, USA]

In each of 2 trials, 84 Cobb colour-sexed broiler breeder hens were slaughtered at 52 wk of age using standard techniques except for subscald and overnight chilling (1°C). After 4 wk frozen storage, 12 birds were randomly assigned to each of 7 treatments, a control, and a 2 × 3 factorial arrangement of 2 brining times (16 and 32 h) and 3 brine concn. (2.5, 5.0 and 7.5% NaCl). The treated birds were slow-cooked with smoke. Both light and dark meat samples were evaluated for flavour, juiciness and tenderness by a taste panel. In addition, these samples were subjected to shear force analysis. As the salt concn. was increased, the panelists scored dark meat significantly higher for flavour, regardless of brining time. Light meat which had been brined for 16 h was also scored significantly more juicy as the salt concn. was increased. There were no significant differences observed for tenderness, juiciness or flavour for any other combinations of taste panel scores. It appeared, however, that increasing the salt concn. improved scores numerically. Shear force analysis indicated that meat from birds brined at 7.5% salt for 16 or 32 h or 5.0% salt concn. for 32 h was significantly more tender than the meat from unbrined birds. Generally, all treatments appeared to increase tenderness of the meat. AS

50

Spray smoking of bacon and poultry.
Anon.
International Flavours and Food Additives 9 (6) 262, 266 (1978) [En]

A description is given of the first commercially available range of automatic electrostatic spray smoking plants for bacon and other meats. Each new plant, now being introduced by Stewart Gill & Co. Ltd., consists of an overhead conveyor system to transport the product at a constant speed through the process, 2 electrostatic spray guns, which are either fixed or mounted on automatic reciprocating units, and conditioning and drying chambers. A range of bacon smoking plants with throughputs of between 10 and 200 t/wk has been designed. Because of the speed of the process and the relatively low temp. rise involved, the wt. losses are extremely low, usually of the order of 0.5–1.5%. Advantages of the system are: substantial savings in initial capital outlay and operating costs; increased yield on account of low wt. losses; flavouring losses are very low; and effluent air from the process is free of any objectionable odour. The first processor to operate one of the new plants John Wragg Ltd., of Sheffield, has a cycle time of about 90 min, and on single shift working is capable of producing 500 pieces of smoked bacon/wk. VJG

51

Determination of phenol, guaiacol and 4-methylguaiacol in wood smoke and smoked fish-products by gas-liquid chromatography.
Luten, J. B.; Ritskes, J. M.; Weseman, J. M.
Zeitschrift für Lebensmittel-Untersuchung und -Forschung 168 (4) 289–292 (1979) [11 ref. En, de] [Inst. for Fishery Products TNO, Dokweg 37, NL-1976 CA Ymuiden, Netherlands]

A simple isolation procedure and GLC detn. for phenolic compounds in smoke and smoked products are described. Fish samples are defatted by ether extraction of a homogenate, the protein is precipitated with trichloroacetic acid, and the supernatant is extracted with chloroform in the presence of 0.36 g NaCl/ml at a pH of approx. 6. Extraction yields are 99, 65 and 100% for guaiacol, phenol and 4-methylguaiacol, resp. Corresponding overall recoveries for the isolation procedure are 84, 63 and 76%. The chloroform layer is used for GLC detn. using columns packed with 10% ethyleneglycol adipate on Chromosorb W-AW. The method of standard addition is used to detn. concn. Concn. of the phenolic compounds were measured in cold-smoked herring as a function of smoking time, 0.5–7.5 h; concn. of all 3 increased linearly with time. Small losses of phenolic compounds in the presence of herring are thought to be due to changes of distribution between chloroform and sample solution. Concn. of the phenolic compounds in the gaseous smoke phase in the smoke house during smoking of the herring samples studied are tabulated. DIH

52

[Nutritional value of cooked sausages.]
Dubinskaya, A. P.; Kulikova, V. V.; German, N. A.
Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 5, 163–165 (1978) [6 ref. Ru] [Stavropol'skii Politekh. Inst., Stavropol', USSR]

Nutrient contents of various smoked sausage types were compared with values specified in the appropriate Soviet standards. Fat/protein ratios were 1.5:1 to 5.8:1, well above the recommended level of 1:0.8. The moisture/protein ratio ranged from 4.7:1 to 7.7:1, and was close to the recommended values. The smoked sausages studied were found to have low S amino acid concn.; supplementation with milk protein is recommended. STI

53

Smoking agent.
Kulesza, J.; Miler, K.; Podlejski, J.; Gora, J.; Czajkowska, T.; Kozlowski, Z.; Kolska, J.; Stolowska, J.; Rutkowski, Z. (Poland, Politechnika Lodzka, Instytut Przemyslu Miesnego)
United States Patent 4 136 206 (1979) [En]

A method is described of obtaining a smoking agent from a smoke condensate obtained from the destructive distillation of cellulose or lignin material which comprises extracting the smoke condensate with an aqueous solution of a mineral acid to remove organic nitric bases thereby leaving a purified condensate and then effecting a 2-stage distillation of the purified condensate under reduced pressure in an inert gas atm in the presence of anti-oxidative amounts of Zn dust, Al dust or Fe dust with substituted norbornane derivatives. IFT

54

[Carcinogenic N-nitrosamines in foods.] [Review]
Kostyukovskii, Ya. L.; Arkhipov, G. N.; Melamed, D. B.; Zhukova, G. F.
Zhurnal Vsesoyuznogo Khimicheskogo Obshchestva im. D. I. Mendeleeva 23 (4) 406–410 (1978) [53 ref. Ru]

[Inst. Pitaniya AMN SSSR, USSR]

Nitrosamines (NA) have exceptionally high activity, affect several organs and are easily produced from their precursors (amines and nitrites). Methods of separation and detn. are given. Contents of NA in meat, fish, milk, and vegetable and various other products are presented; NA contents are high in smoked meat and fish. Potential methods of reducing NA in foods are discussed; these include reduction in nitrites and nitrates concn., modifications of smoking techniques and reduction of NA synthesis by addition of inhibitors, such as ascorbates, erythorbates and vitamin A. STI

55

[Changes in the microflora of smoked fish during cold storage.]
Kudryasheva, A. A.
Kholodil'naya Tekhnika No. 11, 30-32 (1978) [2 ref. Ru] [Moskovskii Ordena Trudovogo Krasnogo Znameni Inst. Narodnogo Khozyaistva im. G. V. Plekhanova, Moscow, USSR]

Changes in the counts and composition of microorganisms were studied under commercial conditions on the surface of cold smoked fish stored at −5° to −7°C. It was established that yeasts, bacteria and moulds actively multiplied under such conditions. The length of storage period for sturgeon-type fish was established as ranging from 30-35 days for some kinds of fish to 70 days for others. Storage tests were carried out at air RH 85-90%. STI

56

[Production of moulded smoked cod sausage meat.]
Men'shova, O. I.
Rybnoe Khozyaistvo No 12, 58-60 (1978) [1 ref. Ru] [TINRO, USSR]

A technology was developed for moulded smoked cod sausage meat products known as loaves. These are produced from fresh or refrigerated cod, either from the whole fish or from minced meat. The production process is as follows: thawing, coarse and fine mincing, dehydration by pressing, blending with 5% vegetable oil and 1.5% salt, moulding, ageing, drying and smoking. Partial separation of water has a favourable effect on the cohesion of the product, and the ingredients encourage stickiness of the sausage meat. The loaves are hand moulded and weigh 300-600 g each. Drying is carried out at 70-90°C for 10-20 min and smoking at 130-140°C for 75-85 min. STI

57

Instrumental multiple texture profile analysis of cooked ground beef patties and smoked beef.
Voisey, P. W.; Larmond, E.
Journal of Texture Studies 8 (1) 93-107 (1977) [14 ref. En] [Res. Branch, Agric. Canada, Ottawa, Ontario K1A 0C6, Canada]

An instrumental texture profile for cooked hamburger patties was obtained by repeated tests on the same samples in the wire extrusion cell of the Ottawa Texture Measuring System. The correlation between sensory and instrumental texture profile parameters was increased when 2 or more instrument test cycles were applied to each sample in the same test cell. Tests with smoked beef and hamburger patties showed that the change in textural characteristics with repeated cycles depended on the texture of the food. AS

58

[Technology of smoking of meat products.] [Review]
Hsu, L. A.
Boletim do Instituto de Tecnologia de Alimentos, Brazil No. 52, 1-10 (1977) [16 ref. Pt, en] [Inst. de Tecnologia de Alimentos, Avenida Brasil 2880, Caixa Postal 139, Campinas-CEP 13.100, Sao Paulo, Brazil]

Aspects considered in this review include: traditional and modern smoking equipment; smoke generators; liquid smoke, and its composition and use; smoke deposition, and factors affecting it; and the composition, organoleptic properties, microbiological characteristics, storage life etc. of smoked meat products. AJDW

59

[Content of benz[a]pyrene in dispersed smoking medium in relation to aerosol particle size.]
Fedonin, V. F.; Kuznetsov, V. V.; Bershova, T. M.; Basmanov, P. I.
Myasnaya Industriya SSSR No. 12, 35-36 (1978) [6 ref. Ru] [Moskovskii Tekh. Inst. Myasnoi i Molochnoi Promyshlennosti, Moscow, USSR]

Benz[a]pyrene content in commercially generated smoke was studied with the aim of reducing its content by means of filters. A 6-stage apparatus was used, the smoke being divided into 6 fractions. The last stage comprised an analytical filter (AFAVP-20), in which all small particles were trapped. Smoke generated by the "Elro" apparatus was studied. Particles with an average diam. of 1.5 μm were predominant. Filters were extracted in Soxhlet apparatus for 2 h with cyclohexane, and the extract was analysed by chromatography. The highest benz[a]pyrene content was found in particles 1.5-0.75 μm in diam., forming the greatest part of the dispersed phase of the smoke. The choice of suitable absorbing agents is recommended for efficient reduction of benz[a]pyrene without reducing the smoking properties. STI

60

[Bacon. General requirements of salted, smoked and boiled bacon.]
Hungary, Magyar Szabvanyugyi Hivatal
Hungarian Standard MSZ 5852/2-77, 6pp. (1977) [Hu]

61

The control of the botulism hazard in hot-smoked trout and mackerel.
Cann, D. C.; Taylor, L. Y.
Journal of Food Technology 14 (2) 123-129 (1979) [18 ref. En] [Torry Res. Sta., 135 Abbey Road, Aberdeen AB9 8DG, UK]

The growth and toxin production of Clostridium botulinum types B, C, E and F in hot-smoked trout and mackerel were studied. Using whole trout naturally contaminated with Cl. botulinum type E it was established that salt was the major inhibiting factor; a min. concn. of 2.5% salt-on-water phase prevented the production of toxin for 30 days when fish were stored at 10°C. When whole and minced fish were inoculated with spores of Cl. botulinum types B, E and F at a concn. considerably higher than that found in nature (10^2/g) a min. salt concn. of 3% was required to achieve a similar effect. Further studies using trout inoculated with suspensions of a number of strains of Cl. botulinum containing both spores and vegetative cells (10^2/g) showed that fish smoked to produce a min. salt concn. of 3% had a safe shelf life of 30 days at 10°C and 1 day at 20°C. AS

62

[Procedure and apparatus for slicing smoked salmon.]
Saumon, P. C.
French Patent Application 2 395 707 (1979) [Fr]

Because salmon has a layered structure, unlike meat, it is more liable to break during cutting. A slicing mechanism is illustrated in which the fillet is mounted at an angle with its longitudinal axis in a vertical position and the slices are turned over by the rotating cutter blade onto a receptor plate. W&Co

63

It's the perfect cure.
Wray, T.
Fishing News International 18 (3) 32–33 (1979) [En]

Most of the mechanical smoking kilns and other modern curing equipment in worldwide use are made by the British firm Afos Ltd. This article describes the company's products, where they are being used and how they are helping to improve the curing of fish. The Torry kilns are designed for mechanical hot and cold smoking, drying and cooking a wide range of products and are manufactured in a wide range of capacities (150–1270 kg), as well as a mini kiln (capacity 25 kg) which can be used for trial smoking of new and underutilized fish spp. The Autonomic drier for zero to low salt content products, and the Salt fish drier designed for pre-salted fish, have great potential particularly the developing countries. The company also produces mechanical defrosting equipment. AL

64

[Some physical properties of curing smoke.]
Proskura, Yu. D.
Issledovaniya po Tekjnologii Rybnukh Produktov No. 7, 81–89, 109 (1977) [5 ref. Ru, en]

Mathematical formula are given for determining the density, and dynamic and kinematic coeff. of viscosity of curing smoke. These were shown to be dependent on the moisture content of the fuel, the coeff. of air excess during burning, the air-to-smoke ratio and the temp. of curing (specifically of fish). HBr

65

[Generation of curing smoke in an experimental smoke generator with a vibrating heating surface.]
Proskura, Yu. D.; Smirnov, A. V.
Issledovaniya po Tekjnologii Rybnukh Produktov No. 7, 75–80, 109 (1977) [1 ref. Ru, en]

An illustrated description is given of a new smoke generator incorporating vibrating heating surface and an ash removal mechanism. Optimum operating parameters for use with sawdust are given, including frequency and amplitude of vibration, angle of inclination of vibrating surface, sawdust feed rate, and heating surface temp. [See also preceeding abstr.] HBr

66

[Microbial contents of smoked fish.] Zum Keimgehalt von Räucherfischen.
Kleickmann, A.; Schellhaas, G.
Archiv für Lebensmittelhygiene 30 (1) 26–29 (1979) [9 ref. De, en] [Landes-Veterinäruntersuchungsamt für Rheinland-Pfalz, Blücherstrasse 34, 5400 Koblenz, Federal Republic of Germany]

123 samples of smoked fish collected for official inspection were examined for sensory and microbiological quality. 42 samples had serious sensory defects, 26 samples slight defects. Tabulated results showed that sensory defects were related to total and Enterobacteriaceae counts. Results suggested that aerobic counts $\geq 10^6$/g and Enterobacteriaceae $\geq 10^5$/g must be considered to be health hazards. These limiting values must take account of product-specific factors. As a result of pH and a_w (water activity) detn., smoked fish have to be classified as a medium or highly perishable food. AS

67

[Detection by glass capillary gas chromatography of addition of smoke flavour condensate to sausages.]
Nachweis eines Raucharomakondensatzusatzes zu Wurstwaren mit Hilfe der Glascapillargaschromatographie.
Baltes, W.; Söchtig, I.
Zeitschrift für Lebensmittel-Untersuchung und -Forschung 169 (1) 17–21 (1979) [5 ref. De, en] [Inst. für Lebensmittelchem., Tech. Univ. Berlin, Müller-Breslau-Strasse 10, D-1000 Berlin 12]

The possibility of detection of addition of a smoke flavour condensate to sausage emulsion at the cutting stage was studied using GLC/MS to identify characteristic phenol compounds. Raw sausage and 'Brühwurst' samples were made conventionally and smoked (details of ingredients and processes given) or received additions of smoke flavour condensate to the emulsion and were not smoked. Centre and skin samples of sausages were steam distilled, and the steam distillate was analysed by glass capillary GLC/MS using columns coated with Carbowax 20 M TPA. Contents of 13 phenol compounds in centre and skin samples of all types of sausage studied are tabulated. On the basis of the results, max. levels of guaiacol and syringol, and their 4-methyl and 4-ethyl derivatives, found in conventionally smoked sausages are given. Concn. higher than these are diagnostic of addition of flavour condensate. Addition of flavour condensate to emulsions was also easily demonstrated by study of the distribution of phenol types and comparison of these with the composition of flavour condensate. Allowance must be made for phenol content of spice ingredients, and phenol content of casings of conventionally smoked sausages. Phenols were not found to migrate from casings of conventional sausages to the central part. DIH

68

[Low molecular weight ingredients of smoke flavour preparations.] Niedermolekulare Inhaltsstoffe von Raucharoma-Präparaten.
Baltes, W.; Söchtig, I.
Zeitschrift für Lebensmittel-Untersuchung und -Forschung 169 (1) 9–16 (1979) [21 ref. De, en] [Inst. für Lebensmittelchem. der Tech. Univ. Berlin, Müller-Breslau-Strasse 10, D-1000 Berlin 12]

12 commercially available smoke flavour preparations were analysed by steam distillation and GLC/MS of the steam distillate. Thin film glass capillary columns with Carbowax 20 M TPA gave good separation of aroma ingredients if the glass surface was deactivated prior to coating. 70 aroma compounds were identified, 22 for the first time in smoke flavour preparations. MS data for these 22 compounds are tabulated. The 16 most important phenolic compounds were quantitatively determined; amounts found (in mg/kg) in the 12 preparations are tabulated. Guaiacol was a consistent component of the preparations (24–5869 mg/kg), as was 2,6 dimethoxyphenol (syringol, 37–9609 mg/kg). Sensory evaluations of these 2 compounds and 5 other phenolic compounds are tabulated. DIH

69

Combination smoker-cooker for food.
Jacobson, J. E.
United States Patent 4 130 052 (1978) [En]

Air-tight smoking apparatus has means to raise the temp. of the enclosure high enough to affect cooking while also producing flavouring gases. The apparatus is substantially air-tight; hickory or other exotic wood blocks or chips are used as the source of smoke and an electric heating element raises the temp. to approx. 200–300°F. SP

70

[Method and device for producing wet smoke.] Verfahren und Vorrichtung zum Erzeugen von Feuchtrauch.
Lindenmann, H. (Sümann, H. Lindenmann KG)
German Federal Republic Patent Application 2 731 358 (1979) [De]

Wet smoke for use in the production of smoked food is produced from shredded wood which is moistened until the fibres are saturated, after which they are subjected to a hot air flow. The wet smoke does not contain harmful chemicals and the method ensures that 100% of the aromatic substances is removed. W&Co

71

[Changes occurring in fish during various smoking procedures.]
Khammadi, K. A.; Goncharov, A. M.
Rybnoe Khozyaistvo No. 1, 57–59 (1979) [2 ref. Ru]

Possible changes in the protein tissue of fish (horse mackerel) during hot smoking using either smoke or the liquid smoking preparations Vakhtol and MINKh were studied. Fish heat-processed in the same equipment, but not smoked, served as control. Contents of water (59.3–66.6%), salt (2.6–2.8%) and nitrogenous substances (24.5–25.6%) were not affected by the smoking process. The content of free acids was somewhat higher in smoked fish (0.57 to 0.58%) than in the control fish (0.45–0.47% as acetic acid), but pH was lower in smoked fish (6.16 compared with 6.31). Phenolic substances content was relatively low in the smoked fish (2.6 to 3.1 mg/100 g). No changes were observed in the amino acids composition. STI

72

[New form of pork and process for its preparation.]
Guillemot, H.
French Patent Application 2 396 511 (1979) [Fr]

A joint of pork is cut from chine to point of the breast, including at least part of the flank and the breast. The bone and fat are removed and rolled with the breast round the meaty centre portion. It is then cooked and/or smoked and salted, and served like ham. W&Co

73

[Effect of smoking methods on degradation of pork proteins by proteolytic enzymes.]
Khlamova, R. I.; Solov'eva, L. I.
Myasnaya Industriya SSSR No. 6, 41 (1978) [3 ref. Ru] [Vses. Nauchno-issled. Inst. Myasnoi Promyshlennosti, USSR]

Breakdown of muscle tissue proteins by pepsin and trypsin was faster in pork processed using a liquid smoking agent than by conventional smoking. The proteins of the resultant product were thus of higher biological value. The difference in the proteins degradation rate was attributable to the fact that the liquid smoking agent contained less foreign substance than standard smoke. STI

74

Modern methods of smoking meat products.
Klettner, P.-G.
Fleischwirtschaft 59 (1) 17–18, 20–24; 73–76 (1979) [9 ref. En, de] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

With the aid of diagrams and tables the author discusses modern smoking methods and effects of smoke production (pyrolysis) temp., smoke production methods (smouldering wood, friction, wet smoke or condensate, fluidization, 2-stage smoking, carbonization), smoke temp., and special technological smoking methods. To reduce carcinogens, smoke production temp. should be <400°C (about 350°C) and methods should be considered in relation to smoke production temp., smoke flow, cooling effects and effects of O_2. Smoking temp. depends on the product (e.g. 15–25°C for dry sausage, raw cured meat products, fat bacon, Kochwurst, and 55–80°C for Brühwurst and cooked cured meat products). The following smoking techniques are described: electrostatic smoking, smoking without visible smoke, and closed cycle smoking, as well as prohibited techniques such as evaporation of smoking solution, immersion, and direct addition of smoking solutions. RM

75

Health laws and regulations - European Communities.
World Health Organization
International Digest of Health Legislation 29 (1) 68–71 (1978) [En] [Geneva, Switzerland]

A selection of European Communities health laws and regulations is presented including the following which relate to food hygiene: Council Directive No. 78/50/EEC of 13 Dec. 1977 supplementing, as regards the chilling process, Directive No. 71/118/EEC on health problems affecting trade in poultry meat; Council Directive No. 78/142/EEC of 30 Jan. 1978 on the approximation of the laws of the Member States relating to materials and articles which contain vinyl chloride monomer and are intended to come into contact with foodstuffs; Council Directive No. 78/144/EEC of 30 Jan. 1978 amending for the sixth time the Council Directive of 23 Oct. 1962 on the approximation of the laws of the Member States concerning the colouring matters authorized for use in foodstuffs intended for human consumption; and Council Directive No. 78/145/EEC of 30 Jan. 1978 amending for the 13th time Directive No. 64/54/EEC on the approximation of the laws of the Member States concerning the preservatives authorized for use in foodstuffs intended for human consumption, empowers Member States to authorize the use of liquid smoke solutions (for the treatment of certain foodstuffs) until 31 Dec. 1980. VJG

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INTRODUCTION

Food Annotated Bibliographies (FABs) are collections of abstracts on specific topics in food science and technology. The topics are chosen by the staff of the International Food Information Service as being of particular interest or importance. The topics normally interest individual workers, who may not require the full information provided in Food Science and Technology Abstracts, from which the abstracts for FABs are taken. The size and the cost of the FABs are controlled as much as possible with the interests of individual workers in mind.

Titles of the FABs now available are given on the back cover of this booklet. For up-to-date lists of FABs or suggestions for new topics please write to the address on the back cover. New subjects are searched for at least the five most recent volumes of Food Science and Technology Abstracts. Thereafter each FAB is updated monthly. Copies of each months abstracts on any topic may be obtained as indicated on the back cover of this publication. At the end of each volume of up-dating, the abstracts are merged and made available as a separate supplement to the original FAB.

Some of the larger FABs have been divided into sections to facilitate use. FAB 47 also has a subject and author index provided.

Copies of all original articles referred to in the abstracts may be bought (or occasionally borrowed) from the International Food Information Service. A form for ordering these is provided at the end of this FAB.

Coverage of the subject has been restricted to that of Food Science and Technology Abstracts, which covers over 1200 of the important food journals, patents from 20 countries and books published world-wide. Every effort is made to include all significant references, but editorial discretion is used on the many articles of borderline interest. If the reader particularly needs an exhaustive search of the subject, we will be pleased to provide any other references that we have available. We would, in any case, encourage readers to write or telephone us with any comments or queries that they may have.

H. BROOKES

EDITOR

1

[Statistical and chemical information on methods of investigation. Determination of the smoke point.]
Statistische und Chemische Erkenntnisse über die Untersuchungsmethoden. Die Bestimmung des Rauchpunktes. [Lecture]
Bregulla, F.; Seher, A.
Fette Seifen Anstrichmittel 81 (Sonderheft), 508–511 (1979) [8 ref. De, en] [Bundesanstalt für Fettforschung, Piusallee 68–76, D-4400 Münster, Federal Republic of Germany]

An automatic apparatus for detn. of the smoke point was developed in which all the parameters affecting the smoke point of a fat (external temp., N_2 flow, heating rate) can be kept constant. The effect of the various parameters on the smoke point temp. are discussed. Tabulated results from 10 fats show that all but 1 result are 12–19°C lower than detn. in an open Cleveland crucible. [See FSTA (1980) 12 1N20.] RM

2

Process for hot smoking fish.
Pettinato, F. E.; Herman, M. A.; Koczak, S. (Brown & Williamson Tobacco Corp.)
United States Patent 4 148 925 (1979) [En]

A method of hot smoking fish is described which comprises cooking the fish by subjecting it to a series of 5 cooking steps at defined conditions of temp. and humidity; internal fish temp. of 140–160°F are obtained. IFT

3

Big demand for a mini smoker.
Anon.
Fishing News International 18 (5) 59 (1979) [En]

The 'Little Chief' smoker, claimed to be the only electric smoker used commercially and in the home worldwide, is manufactured by the N. American Luhr Jensen Co. and marketed in the UK by Transatlantic Fishing Systems of Penryn, Cornwall. It is 2 ft^3 and can cure up to 20 lb of fish or meat in 3–6 h. It consists of an Al smoking chamber with electric heat element and lid, a rack carrying 3 grills, and a flavour pan to hold the hardwood chips. AL

4

[Changes in fatty acid composition of lipids of catfish during hot smoking.]
Goncharov, A. M.; Khamadi, K. A.
Rybnoe Khozyaistvo No. 3, 54–57 (1979) [Ru]

Fatty-acid composition changes in the lipids of catfish during hot smoking and subsequent storage in frozen condition were studied. In fish treated only by heat or those in which a smoking liquid was used during salting, the amount of polyunsaturated fatty acids was lower than in the original fish (27.37–28.83%, vs. 31.18%). An even greater decrease in the content of polyunsaturated fatty acids was observed in fish treated with the smoking liquid only during smoking. During long-term frozen storage (50 days) a marked decrease in the content of polyunsaturated fatty acids was observed only in fish which had been treated with MINKH smoking liquid. The results support the opinion that the smoking liquids Vakhtol and MINKH have a slight antioxidant effect. STI

5

Process smokes and cures at same time.
Pannell, R. J. H.
Fishing News International 18 (5) 57 (1979) [En]

Advantages of the process jointly developed by White Stevenson and Volstatic Coatings for smoking and curing at the same time are described. A table shows the advantageous cost implications of this electrostatic process compared to traditional smoking for producing smoked haddock. Technical and marketing advantages include: an alternative colour to Brown FK if this should become necessary; elimination of benzpyrene and other polycyclic compounds; standardized salt and colour levels; increased succulence of 'boil-in-bag' product; reduction of microbiological hazards; and the process lends itself to continuous production. AL

6

[Use of concentrated starter cultures in the manufacture of cold smoked sausages.]
Rei, M. K.; Kirikall, V. V.; Redel', Yu. R.; Luts, V. Kh.; Teemusk, A. R.
Myasnaya Industriya SSSR No. 7, 21–24 (1978) [3 ref. Ru] [Estonskaya Sel'skokhozyaistvennaya Akademiya, USSR]

Tests of laboratory as well as commercial batches of sausage (salami) showed that the advantage of using conc. bacterial cultures depended primarily on the initial contamination of the sausage meat; this was 10^4–10^5/g under laboratory conditions and 10^6–10^7/g under commercial conditions. The organisms used in the test were *Streptococcus diacetilactis* 606 and *Lactobacillus plantarum* LI in a ratio of 1:1, and added at a rate of 10–15 million organisms/g. Addition of the conc. bacterial cultures accelerated ripening and formation of aroma and flavour by 5–10 days, but the difference in aroma and flavour intensity between experimental and control salami (without added cultures) disappared during further ripening and storage. A larger quantity of bacterial cultures needs to be added to sausage meat with a higher rate of contamination. Conc. bacterial starter cultures may be stored at low (above-zero) temp., and do not require additional processing before addition to the sausage meat. STI

7

Keeping quality of cured and/or smoked chicken stored at two different temperatures.
Singh, R. P.; Mahadevan, T. D.
Indian Poultry Gazette 62 (4) 138–144 (1978) [12 ref. En] [Poultry Res. Div., Indian Vet. Res. Inst., Izatnagar, Uttarpradesh-243122, India]

Dressed, cut-up chicken was cured for 72 h at 5–6°C in curing solution containing 13.6% NaCl, 6.8% cane sugar, 0.16% $NaNO_2$, 0.21% $NaNO_3$, 0.05% monosodium glutamate and 10 p.p.m. mycostation, smoked in hardwood smoke for 4 h at 40–45°C, and stored at room temp. (25–26°C) or under refrigeration

(5–6°C). Untreated control samples became unfit for consumption after 24 h at room temp., or after 10 days under refrigeration. Cured chicken could be stored for 4 days at room temp. or 12 days under refrigeration, whereas cured and smoked chicken was edible after 12 days at room temp., and after 32 days under refrigeration. A taste panel preferred cured and smoked chicken over the other samples, for its colour, flavour, and taste. CFTRI

8

Method of producing from wood tar a liquid smoke product for use in food processing and products of said method.
Dainius, B.; Dame, C.; O'Hara, J. (Stange Co.)
United States Patent 4 154 866 (1979) [En]

A method is described for producing from wood tar a liquid smoke product containing no detectable amount of 3,4-benzopyrene, which involves mixing approx. 3 parts by wt. wood tar with 1 part by wt. propylene glycol, heating the material to 280–290°F, reducing pressure to 100 mm Hg to cause codistillation of the desired components with propylene glycol and forming a liquid fraction and a vapour fraction, and condensing the vapour fraction which is then treated with a small % of activated C to assure 3,4-benzopyrene content is <0.5 parts/billion by wt. SP

9

[Smoked poultry roll, leg and whole carcass.]
Bulgaria, D"rzhaven Komitet za Standartizatsiya
Bulgarian Standard BDS 14588-78, 4pp. (1978) [Bg]

This standard covers constituents of the product, and general requirements, e.g. shape, dimensions, appearance. Specific requirements include: salt, ≤ 3 wt.%; nitrites ≤ 5 mg/100 g; water. ≤ 65 wt.%; pathogens, moulds, coliforms and *Proteus* spp. (in 1 g), no tolerance. Products shall be stored at −1° to +4°C; shelf life is 4 days. HBr

10

[Energy consumption and energy types for hot-smoking equipment.] Energieverbrauch und Energiearten für Heissrauchanlagen.
Lange, W. G. K.
Fleischerei 30 (4) 287–288 (1979) [De] [Im Ginsterbusch 7, D-2000 Hamburg 61, Federal Republic of Germany]

Energy consumption in equipment for smoking of meat products is discussed, with reference to dry and moist heating of the circulating air, smoke generation, environmental protection measures, and unavoidable use of electricity for motors etc. The relative merits of the various energy sources (oil, gas, electricity) are briefly considered. Examples are given of energy consumption and energy costs of individual aspects of hot-smoking of Brühwurst sausages. AJDW

11

[Technology of rapid chilling of cooked sausage products.]
Sheffer, A. P.; Konchakov, G. D.; Klimova, B. A.; Musatova, N. V.
Trudy, Vsesoyuznyi Nauchno-issledovatel'skii Institut Myasnoi Promyshlennosti No. 35, 50–59 (1976) [Ru, en, de] [VNIIMP, USSR]

Studies on development of new methods for rapid chilling of cooked smoked meat products are described. Effects of cooling in water or air, or a combined water/air chilling procedure, on chilling time and the wt. losses and appearance of the product were investigated in trials on 3 types of sausage. The results show that the combined procedure (cooling initially with water, and then with low-temp. circulating air) is best. This procedure reduced costs, considerably reduced wt. losses and chilling times, and improved the appearance of the product. STI

12

[Optimization of heat treatment procedures for meat products.]
Pokorny, F.
Prumysl Potravin 30 (3) 170–172 (1979) [Cs] [Vyzkumny Ustav Masneho Prumyslu, Brno, Czechoslovakia]

Recommended procedures in sausage production include drying at 75–90°C and 30% RH; smoking at 75–85°C and 65–75% RH (higher RH should be avoided, and smoking should be completed at 55–58°C internal temp.); cooking at 72–78°C and 90–95% RH, an internal temp. of 70°C being maintained for 10 min; and cooling by water spray followed by cold air to 8–10°C internal temp. Duration of water and air cooling and % wt. losses in normal and rapid cooling are tabulated for 3 kinds of sausage. Technical data are tabulated for the heat-treatment sections of Mikulov-4, Atmos, Bud II and Aktua smoking installations of resp. 300, 395, 50 and 780 kg/h capacity. They are combined with a smoke generator; the Germos type using superheated steam at 280–380°C acting on wood chips is considered best. SKK

13

[Method of treatment of meat product surfaces to give a smoked colour and flavour.] Verfahren zur Oberflächenräucherwürzfärbung von Fleischwaren.
Henning, W.
German Federal Republic Patent Application 2 804 184 (1979) [De]

Meat products, particularly sausage, saveloy and the like, are treated with a hot solution containing 8–15 µg benz[a]-pyrene/kg. A typical solution is prepared from 20 parts of a sugar/salt/beechwood mixture to which are added 30 µg benz[a]-pyrene/kg, 15 parts red beet powder, 2 parts parsley powder, 5 parts cocoa powder or caramel, and made up to 100 parts with water. 20 parts of this solution are diluted with 80 parts water for use as a smoking, spicing and colouring agent. W&Co

14

[Nutritive value of meat trimmings, and their utilization for sausage production.]
Bushkova, L. A.; Morozova, L. I.; Fomenko, G. I.; Krylova, N. N.
Trudy, Vsesoyuznyi Nauchno-issledovatel'skii Institut Myasnoi Promyshlennosti No. 40, 6–11 (1977) [5 ref. Ru]

The nutritive value of meat trimmings from deveined beef and pork was studied, with the aim of development of a method for using such trimmings in the manufacture of smoked sausages. Aspects studied included pH, protein quality index, and concn. of moisture, fat, N, hydroxyproline and connective tissue proteins, together with N concn. in the extractible substances. Provided that they are correctly treated and stored, meat trimmings may be substituted for grade II beef or semi-fatty pork in sausage manufacture. It is advantageous to use chilled meat trimmings; quality is retained, without wt. losses due to thawing. Recipes, using beef or pork trimmings, are given for various meat products. STI

15

Quality characteristics of brine-chilled and smoked Bobwhite quail.
Arafa, A. S.; Janky, D. M.; Wilson, H. R.; Oblinger, J. L.; Koburger, J. A.
Journal of Food Science 44 (5) 1435–1439, 1446 (1979) [23 ref. En] [Dep. of Poultry Sci., Univ. of Florida, Gainesville, Florida 32611, USA]

480 Bobwhite quail were sacrificed at 16 wk of age to study the effect of brine-chilling and smoking on carcass cooling rate during chilling, water uptake, thawing losses after frozen storage, cooking yield after smoking, tenderness and organoleptic characteristics of the smoked meat. Equal numbers of male and female carcasses were chilled in 0%, 5%, or 7.5% brine solutions for 1, 2, 3 or 4 h, in a 2 × 3 × 4 factorial experimental design. Removal of body heat of the carcass during chilling was accomplished at a much faster rate when brine-chilling was used. Increasing the brine concn. from 5 to 7.5% resulted in a faster cooling rate. Brine chilled carcasses had significantly ($P < 0.05$) greater % water uptake during chilling, lower thaw losses and higher cooked yield than the slush-ice chilled (control) carcasses. Smoked meat from brine-chilled carcasses had significantly ($P < 0.05$) lower shear force readings (indicating more tender meat) and better organoleptic scores when compared with smoked meat from the control carcasses. Increasing the chilling time resulted in significantly more tender meat and better juiciness scores. Tissue NaCl concn. was increased when higher brine concn. or longer chilling time was used. IFT

16

Design of a generator for studying isothermally generated wood smoke.
Ugstad, E.; Olstad, S.; Vold, E.; Hildrum, K. I.; Fretheim, K.; Hoyem, T.
Journal of Food Science 44 (5) 1543–1544, 1549 (1979) [10 ref. En] [Norwegian Food Res. Inst., PO Box 50, N-1432 Aas-NLH, Norway]

A laboratory size smoke generator, working under controlled conditions, was constructed. The generator is basically a closed system to allow control over the supply of air, and it can produce smoke at a specific, desired temp. (within ± 10°C) in the region 300–550°C. This makes possible meaningful and systematic studies of important properties of smoke generated at various temp., such as its antimicrobial, antioxidative, flavour and colour producing effects, and content of polycyclic aromatic hydrocarbons. IFT

17

Summaries of additional papers on smoke curing. [Conference procedings]
Daun, H. (**United States of America,** Institute of Food Technologist) (Chairman)
Food Technology 33 (5) 86, 88, 90 (1979) [En] [Dep. of Food Sci., Rutgers Univ., PO Box 231, New Brunswick, New Jersey 08903, USA]

5 abstr. are published of papers presented at the Smoke curing – advances in theory and technology Symposium, held at the 38th Annual Meeting of the Institute of Food Technologists 4–7 June 1978, Dallas, Texas. Copies of complete papers are obtainable from the symposium chairman. Titles of the papers are listed as follows. Traditional smoke curing of mutton in Iceland, by J. Ögmundsson & S. Adalsteinsson (p. 86). Meat preservation by smoke curing in developing countries, by L. A. Hsu, R. W. Fisher & H. Daun (pp. 86, 88). Current developments in meat smoking and high velocity air cooking, by L. D. Starr & B. N. Ouimette (p. 88). Liquid smoke flavouring – status of development, by C. M. Hollenbeck (pp. 88, 90). The smokehouse process – application of liquid smoke, by H. E. Wistreich (p. 90). 3 additional papers are abstracted individually [see following abstr.]. DIH

18

Color of smoked foods. [Lecture]
Ruiter, A.
Food Technology 33 (5) 54, 56, 58–60, 63 (1979) [24 ref. En] [Dep. of Sci. of Food of Anim. Origin, Fac. of Vet. Med., Univ. of Utrecht, Bilstraat 172, 3572 BP Utrecht, Netherlands]

A review is given of methods for studying conditions for smoke colour formation, of compounds involved in smoke colour reactions, especially carbonyl compounds present in smoke and amino groups in proteinaceous foods, of possible reaction mechanisms, and of compounds present in the disperse phase. Other methods of producing smoke colour, such as by dyeing, are briefly considered. [See also preceding abstr.] DIH

19

Interaction of wood smoke components and foods. [Lecture]
Daun, H.
Food Technology 33 (5) 66, 68, 70–71, 83 (1979) [54 ref. En] [Food Sci. Dep., Rutgers Univ., PO Box 231, New Brunswick, New Jersey 08903, USA]

Effects of wood smoke on nutritive value, safety and sensory properties of foods are reviewed. Beneficial effects on nutritive value include antioxidant and bactericidal action; adverse effects include lowering of available lysine and thiamin. Changes in processing techniques or use of liquid smoke may reduce adverse effects. Food safety is affected by production of polycyclic aromatic hydrocarbons, particularly benzo(a)pyrene, and of nitrosamines; effects of variations of processing techniques on levels of these compounds in foods are considered. Reactions influencing colour and taste of the final product, and influences of temp. and moisture are discussed. Textural changes also occur during smoking. [See also preceding 2 abstr.] DIH

20

Effects of smoke processing on muscle food product characteristics. [Lecture]
Sink, J. D.
Food Technology **33** (5) 72, 74, 78, 80, 83 (1979) [13 ref. En] [Meat Lab., Dep. of Food Sci., Pennsylvania State Univ., University Park, Pennsylvania 16802, USA]

A review is made of effects of various smoking processes on sensory quality, composition and storage characteristics of foods made from meat, fish and poultry. Extensive tabulated data show effects of smoke processing on preference, shear values, individual palatability characteristics, chemical composition of frankfurters, protein composition and amino acid content of pork muscle. Types of process covered include aerosol solid or liquid smoke, and dips or mixes of liquid smoke. [See also preceding 3 abstr.] DIH

21

Determination of benzol[a]pyrene in smoked, cooked and toasted food products.
Lintas, C.; Matthaeis, M. C. de
Food and Cosmetics Toxicology **17** (4) 325-328 (1979) [28 ref. En] [Istituto Nazionale Nutrizione, Rome 00161, Italy]

Samples of smoked, cooked and toasted food products, commercially available in Italy, and some samples of oils and fats were analysed for benzo[a]pyrene. In the commercial samples, benzo[a]pyrene was detected in approx. 73% of the samples at levels ranging from 0.01 to 9.51 μg/kg. Results are presented in tables which give the observed values and literature values for comparison. Benzo[a]pyrene contents (μg/kg) found were: smoked foods (wurstel, 0.46; smoked provola (buffalo milk cheese), 1.28; smoked bacon, 0.25; and fried smoked bacon, 0.16); cooked foods (fat ground hamburger meat, raw and cooked, 0.05; cooked sausage, 0.05; and baked suckling pig – rind, 1.22 and flesh, 0.79); toasted foods (bread, 0.23; toasted bread – 3 min., 0.39, 5 min., 0.56; coffee powder, 0.80; coffee infusion, 0.01; tea leaves, 9.51; and tea infusion, 0.02); edible oils and fats (raw olive oil, 3.59, fried olive oil, 2.36; and butter, 0.47-0.91); and bovine tissues (lean muscle, 0.10–0.27; adipose, 0.07–0.25; and perirenal fat, 0.03–0.14). Levels of benzo[a]pyrene found in food products analysed were lower than levels reported by other investigators for comparable food commodities. VJG

22

Pilot plant processing line for forming, cooking, smoking extruded foods.
Andres, C.
Food Processing 40 (5) 154–155 (1979) [En]

A pilot scale plant is described which produces extruded, baked/smoked food products from a range of materials, e.g. seafood, poultry meat or foods extended with dairy or plant proteins. JRR

23

[Method of smoking fish.]
Popov, M. V.; Torban, S. S.; Bunin, D. Kh. **(Union of Soviet Socialist Republics,** Vsesoyuznyi Nauchno-issledovatel'skii Institut Morskogo Rybnogo Khozyaistva i Okeanografii)
USSR Patent 624 235 (1979) [Ru]

A smoke-air mixture is supplied to the smoking chamber and is removed over the whole cross-sectional plane perpendicular to the longitudinal axis of the fish. To reduce process time, supply and removal of the mixture are alternated at a single cycle time of 30–120 s, and the mixture is supplied perpendicularly to the lateral surface of the fish at a velocity of 0.5–6.0 m/s. W&Co

24

Acceptability of smoked turkey drumsticks with and without nitrite addition.
Olson, V. M.; King, N. A.; Langbehn, J. A.; Stadelman, W. J.
Poultry Science 58 (3) 587–590 (1979) [10 ref. En] [Anim. Sci. Dep., Purdue Univ., W. Lafayette, Indiana 47907, USA]

2 methods of preparing smoked turkey drumsticks were compared as to consumer acceptance. Smoking and cooking methods were the same; however, one brine solution contained nitrite (Product A) and the other did not (Product B). Consumers were asked to rate both products for colour, appearance, flavour, and tenderness as follows: 1 – very good; 2 – good; 3 – fair; 4 – poor. They were also asked: which product do you like best?, which product would you buy?, and what is your opinion on the nitrite-nitrate controversy? Results indicated 65% preferred Product A, 31% Product B, and 4% both products. Results on buying indicated 58% would buy Product A, 28% Product B, 7% both, and 7% neither. Ratings for colour were: Product A 1.6, Product B 2.3 ($P < 0.01$); appearance: Product A 1.8, Product B 2.3 ($P < 0.01$); flavour: Product A 1.8, Product B 2.1 (non-significant); tenderness: Product A 1.8, Product B 2.0 (non-significant). Responses to the nitrite-nitrate question varied greatly from 'needed to prevent food poisoning' to 'against the use of nitrite'. The drumsticks had a 20% shrinkage loss which occurred during smoking and cooking. Drumsticks were priced at $25.00/cwt, brine cost was $4.12/cwt, and total cost was $29.12/cwt for meat and brine. This resulted in an investment of 36.4c/lb of cured-cooked product. AS

25

[Use of forestry raw materials in the food industry.] Einsatz von Rohstoffen aus der Forstwirtschaft in der Lebensmittelindustrie und der Nahrungsgüterwirtschaft.
Wienhaus, O.
Ernährungsforschung **24 (2) 55–59 (1979) [De]** [Sektion Forstwirtschaft, Tech. Univ. Dresden, Tharandt, German Democratic Republic]

Applications of forestry products in the food industry are discussed, with reference to: edible fungi; wild fruits; game; tree juices and derived products; preparation of glucose; xylose and arabinogalactan from wood; and manufacture of liquid smoke preparation from wood pyrolysates. Production of animal feeds from forestry products is also considered. IN

26

[Rapid method for determination of phenolic components in smoked fish.]
Cesare, L. F. di
Tecnologie Alimentari **11 (5) 32–35 (1979)** [5 ref. It, en] [Istituto Sperimentale per la Valorizzazione Tecnologica dei Prodotti Agricoli, Milan, Italy]

A simplified version of the method of Tucker [*Journal of the Association of Official Analytical Chemists* (1942) 25, 779], suitable for rapid detn. of phenols in smoked fish fillets, is described. 10 g smoked fish are homogenized with 100 ml of an ethanol/water mixture (50:50 v/v); after filtration, 2 ml of the extract are mixed with 5 ml of 0.5% aqueous $Na_2B_4O_7$ and 1 ml of 1/16N *N*-2,6-trichloro-*p*-benzenequinonimide, and held for 30 min for colour development. The violet indophenol compound formed is extracted into *n*-butanol, and its extinction value measured at 635 nm. The concn. of phenolic compounds in the fish sample may then be calculated from reference curves. Recovery was found to be 98.58% for samples with phenols added at a concn. of 3 mg/100 g. Repeatability was good. Phenols concn. is linearly related to extinction value at 635 nm over the range 0–0.8 mg phenols/10 g fish. Approx. 20 analyses/working day may be performed. AJDW

27

Detection of mutagenic polycyclic aromatic hydrocarbons in African smoked fish.
Mossanda, K.; Poncelet, F.; Fouassin, A.; Mercier, M.
Food and Cosmetics Toxicology **17 (2) 141–143 (1979)** [14 ref. En] [Lab. d'Analyse des Denrees Alimentaires, Univ. de Liege, Boulevard de la Constitution, 151, B-4020 Liege, Belgium]

The mutagenicity of 6 polycyclic aromatic hydrocarbons found in African smoked fish was tested using several *Salmonella typhimurium* strains. Compounds tested were: (i) coronene, (ii) benzo[g,h,i]perylene, (iii) triphenylene, (iv) fluoranthene, (v) *o*-phenylenepyrene and (vi) benzo[b]fluoranthene. No mutagenic effect was detected with (vi) towards any of the tested strains. In the presence of S9 mix, mutagenic activity was observed with (v), (i), (ii), and (iii) by the plate incorporation method. Utilizing the bacterial fluctuation test with (iv) a highly significant positive response was obtained with strains TA98 and TA100. These results point out the possible long-term deleterious effects associated with the presence of polycyclic aromatic hydrocarbons. VJG

28

[Smoke components and their effects.]
Rauchkomponenten und ihre Wirkungen.
Schober, B.
Lebensmittel-Industrie **26 (6) 262–264 (1979) [14 ref.** De, en, ru, fr] [Inst. für Hochseefischerei & Fischverarbeitung, Rostock-Marienehe, German Democratic Republic]

Aspects discussed include: constituents of smoke (with special reference to phenols, carbonyl compounds, acids, alcohols, esters, furans and polycyclic aromatic hydrocarbons (PAH)); factors influencing the composition of smoke; desirable effects of smoke on foods (colouring and flavouring activity, preservative action and antioxidant effects); undesirable effects (contamination with toxic substances, adverse effects on essential amino acids); toxicity of smoke constituents; carcinogenicity of PAH; effects of smoke generation method, smoking equipment type, and cooling, washing or filtration of the smoke on the PAH content of smoked fish; and smoke extracts. IN

29

[Method of preparing smoked products from non-fatty fish.]
Grigor'ev, V. S.; Laptev, A. P.; Airapetov, F. S.; Sukhoveev, Yu. D.; Shenderyuk, V. I.; Kolosova, L. A. **(Union of Soviet Socialist Republics,** Kaliningradskoe Proizvodstvennoe Ob"edinenie Rybnoi Promyshlennosti; USSR, Atlanticheskii Nauchno-issledovatel'skii Institut Rybnogo Khozyaistva i Okeanografii)
USSR Patent 651 773 (1979) [Ru]

Product quality and yield are improved and process time reduced by brining, soaking, drying, coating with an oily liquid, and smoking. The liquid comprises vegetable oil, a mixture of vegetable oils, 80% glycerine or edible rendered fish fat with an acid number of <5 and containing small amounts of polymerization products. W&Co

30

[Smoking equipment used in the fish industry of the German Democratic Republic, and possibilities for its mechanization.] Räucheranlagen der Fischindustrie der DDR und Möglichkeiten ihrer Mechanisierung.
Klietz, R.
Lebensmittel-Industrie 26 (6) 257–261 (1979) [6 ref. De, en, ru, fr] [Inst. für Hochseefischerei & Fischverarbeitung, Rostock-Marienehe, German Democratic Republic]

Types of smoking unit used for fish processing in the German Democratic Republic are described, with special reference to tunnel-type smoking units in which trolleys containing the product are moved through the tunnel to different sections for each stage of processing, and the Thermax smoking unit in which the trolleys containing the product remain in a single position during processing. In other countries, the Torry smoking unit and the Kvaerner smoking tunnel are widely used; descriptions are given of these 2 smoking systems. Possibilities for mechanization and rationalization of smoking systems for fish are discussed, with reference to: transport of the product within the smoking unit, use of IR cooking, electrostatic smoking, use of smoke extracts, spitless smoking procedures, and use of process control to minimize climatic and subjective factors. IN

31

[Physico-chemical properties of smoked chicken.]
Onogi, T.; Toyoda, M.
Journal of Japanese Society of Food Science and Technology [Nippon Shokuhin Kogyo Gakkaishi] 25 (3) 158–161 (1978) [7 ref. Ja, en] [Agric. Management Acad. of Yamagata Prefecture, Shinjo-shi, Yamagata, Japan]

Physico-chemical properties of smoke-cured meat from White Leghorn (10 months old) and Rhode Island Red hens (10 and 20 months old) were compared. So far as pH, moisture, soluble N content, thiobarbituric acid (TBA) value and contents of free amino acids in soluble N were concerned, little variation was observed among samples. Contrary to this, proteose-peptone N content of Rhode Island Red samples and VBN content of the 20 months old hens were a little lower than in the other samples. Texture of the smoked meat was measured by texturometer; smoke-cured leg meat of Rhode Island Red hens (20 months old) showed the highest hardness value. AS

32

[Method of preparation of dried smoked meat products.] Verfahren zum Herstellen von dehydrierten, geräucherten Fleischwaren.
Seibold, A., Sr.
German Federal Republic Patent Application 2 759 309 (1979) [De]

The meat, e.g. Swiss ham, is held in a pickling solution for approx. 5 days under high pressure (approx. 100 atm), during which the meat dehydrates with a loss in wt. of 15–30%. The dehydrated meat is then smoked. It is claimed that the product obtained is low in nitrite and benzopyrene contents. W&Co

33

Studies on curing and smoking poultry meat.
Moorjani, M. N.; Raja, K. C. M.; Puttarajappa, P.; Khabade, V. S.; Mahendrakar, N. S.; Mahadevaswamy, M.
Indian Journal of Poultry Science 13 (1) 52–57 (1978) [10 ref. En] [Cent. Food Tech. Res. Inst., Mysore-570 013, India]

Conditions were standardized for the production of smoke-cured poultry by 3 methods: injection and curing; injection and pickle curing; and pickle curing. The products were evaluated for tenderness, juiciness, colour, flavour, saltiness, rancidity, and microbiological quality. Pickle cured poultry had the longest shelf-life, because of uniform distribution of salt within the muscle. The moisture content of smoke-cured poultry packaged in polythylene or Cryovac bags and stored in wire-mesh boxes was 55.58%, the NaCl content was 5%. The product could be stored for 6–7 days at approx. 30°C and 60–95% RH. Smoke-cured poultry coated with an ethylene glycol-gelatin film could be kept a room temp. without much surface dehydration. CFTRI

34

Volatile nitrosamines in various cured meat products: effect of cooking and recent trends.
Sen, N. P.; Seaman, S.; Miles, W. F.
Journal of Agricultural and Food Chemistry 27 (6) 1354–1357 (1979) [26 ref. En] [Food Res. Div., Health Protection Branch, Ottawa, Canada K1A 0L2]

A study was carried out to determine the effect of cooking on levels of volatile nitrosamines in various cured meat products. Of 64 samples tested, 39 were negative (<0.1 parts/billion, p.p.b.) both before and after cooking. The majority of the positive samples contained extremely low levels (<1 p.p.b.) of nitrosamines; the highest level detected was 8.6 p.p.b. *N*-nitrosopiperidine in a sample of spiced smoked beef. Only in 2 cases were significant increases in the levels of nitrosamines observed after cooking. 10 samples of baby foods containing various meat products were all found to be negative. In addition, 12 samples of fried bacon and 10 of cooked-out bacon fats were analysed; all were positive for *N*-nitrosopyrrolidine and *N*-nitrosodimethylamine, and in some cases *N*-nitrosodiethylamine. Results indicate a continuously lowering trend in the levels of volatile nitrosamines in all types of cured meat products, except fried bacon. AS

35

Smoking apparatus.
Tobey, F. S.
United States Patent 4 175 484 (1979) [En]

Smoking apparatus is described consisting of a container for a stack of smoke-producing members, a guide retort, means to drive successive members of the stack into the guide retort, heating means and a food enclosure positioned adjacent to the guide retort. IFT

36

Studies on smoke curing and preservation of oil sardine *(Sardinella longiceps)*.
Chandrasekhar, T. C.; Rudra Setty, T. M.; Udupa, K. S.
Fishery Technology 16 (1) 47–52 (1979) [19 ref. En] [AICRP on Utilization of Trash Fish (ICAR), Coll. of Fisheries, Mangalore-575 001, India]

A method was developed for smoke curing of oil sardine. The fish is dry salted (salt:fish ratio 1:6) and smoked in a traditional smoke chamber using coconut husk, wood shavings and sawdust (2:2:1). Smoking is done in 2 stages, at 45°C for 3 h and at 75°C for 2 h. The final product has a shelf life of 8 wk at room temp. (26–28°C) and has good odour, flavour and golden yellow colour. CFTRI

37

Smoke curing of mussels.
Muraleedharan, V.; Unnikrishnan Nair, T. S.
Fishery Technology 16 (1) 29–31 (1979) [3 ref. En] [Calicut Res. Cent., Cent. Inst. of Fisheries Tech., Calicut-673 005, India]

Green mussels after cleaning were blanched in 5–15% brine for 5–10 min and the salt content and total N were determined. They were dried to 40–45% moisture, and smoked at 50–90°C for 15–120 min using burning coconut husk and sawdust. Final drying was done in sun or using a drier to 10% moisture. The proximate composition of smoked mussel was determined. It was found that blanching for 5 min in 5% brine solution followed by smoking for 30 min at 80–90°C gave a good product. Final product yield was 22%. CFTRI

38

[The influence of smoking technology on the composition of polycyclic hydrocarbons in smoked meat products, smoke condensates and in waste gases from smoking plants.] Einfluss der Räuchertechnologie auf die vollständige Zusammensetzung der polycyclischen Kohlenwasserstoffe in geräucherten Fleischwaren, in Räucherkondensaten und in den Abgasen von Räucheranlagen.
Potthast, K.
Fleischwirtschaft 59 (10) 1515–1523 (1979) [31 ref. De, en] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

Published analytical and preparative methods for detn. of 3,4-benzpyrene (3,4-B) and other aromatic polycyclic hydrocarbons (PAH) in smoke and smoked meat products were optimized and applied to commercial and laboratory-generated smoke condensates, and commercial and laboratory-smoked meat products. All methods and results are reported in detail. Isocyclic and heterocyclic PAH fractions were examined separately. The heterocyclic fraction could not be further separated and will be considered in a later report. Fractionation of the isocyclic components by capillary GLC, MS and MIS (multiple ion selection) spectra allowed quantitative detn. of PAH with mol. wt. 116–302. Tabulated results showed that low mol. wt. PAH predominated in smoke and in smoked meats. Phenanthrene (Ph) was present in the highest concn., at ratios Ph:3,4-B, 41:1 to 79:1 in smoke, 11:1 to 51:1 in meats; the ratio low mol. wt. PAH:3,4-B occasionally reached 100:1. The ratio of high mol. wt. PAH with mutagenic or carcinogenic action to 3,4-B did not vary greatly and rarely exceeded 1:1, confirming the usefulness of 3,4-B as an index of health hazards from smoked meats. Using 1 part/billion 3,4-B as guide value, it was exceeded in 60% of cooked black-smoked ham (60 samples, max. 15.6 parts/billion) and 25% of raw black-smoked ham (28 samples, max. 15.0), mainly in the surface soot layer. High concn. were also found in dry sausages (max. 5.42 parts/billion in natural, and 51.00 parts/billion in synthetic casings). RM

39

[Benzo(a)pyrene contents of meat products.] Benz(a)pyren in Fleischerzeugnissen.
Binnemann, P. H.
Zeitschrift für Lebensmittel-Untersuchung und -Forschung 169 (6) 447–452 (1979) [20 ref. De, en] [Landesuntersuchungsamt für das Gesundheitswesen Nordbayern, Fachbereich Chemie, Henkestrasse 9-11, D-8520 Erlangen, German Federal Republic]

Benzo(a)pyrene (BaP) contents of 386 smoked and 18 grilled meat products were determined by application of capillary gas-chromatography-mass fragmentography using internal standards. 82% of 183 black smoked hams contained appreciably more than the legal max. amount of 1 µg/kg. The quantities of BaP increased greatly with increase of soot accumulation on the surface. Only 15% of 95 hams and only 9% of 87 sausages smoked by normal methods had excessive BaP content. The amounts by which 1 µg/kg was exceeded were much lower in these hams. Bratwurst grilled by use of pine-cones, spruce-cones and hard wood contained on average 28 µg BaP/kg. The BaP amounts of Bratwurst grilled over charcoal were without exception <1 µg/kg. AS

40

New methods in meat processing. [Lecture]
Schmidt, G. R.
Proceedings of the Meat Industry Research Conference pp. 31–40 (1979) [41 ref. En] [Univ. of Illinois, Urbana, Illinois 61801, USA]

Developments in meat processing are discussed, with reference to: vacuum chopping of sausage emulsions, and its effect on myosin extraction, product density, keeping quality and colour stability; sectioned and formed meats (with reference to effects of tumbling and massaging on ham quality, use of soy protein isolate in sectioned/formed meats, testing of binding of meat pieces, and the binding ability of various non-meat proteins); controlled atm smokehouses, with reference to effects of RH during smoking on product quality, cooking losses, processing times, etc.; and modified atm packaging, covering high CO_2-low O_2 atm, cryogenic O_2/N_2 blends, hypobaric atm and vacuum packaging, together with their effects on microbial growth, meat colour, etc. [See FSTA (1980) 12 5S714.] AJDW

41

What's new in the old technologies: cooking, chopping and converting. [Lecture]
Starr, L. D.
Proceedings of the Meat Industry Research Conference pp. 41–48 (1979) [En] [Koch Supplies Inc., Kansas City, Missouri, USA]

Developments in meat processing technology are discussed. Aspects considered include: smokehouses, with special reference to energy costs, and the relatively low thermal efficiency of direct gas-fired smokehouses; advantages of vacuum cutting and emulsifying of sausage emulsions (with reference to improved oxidative stability, colour stability and microbiological quality, less emulsion breakdown in smokehouses with uneven temp., and increased potential for utilization of meat with relatively low binding capacity); and tumbling/massaging of cured meats (with reference to increased yield, easier control of % brine pumped, reduced curing brine requirements, types of massaging and tumbling equipment, the relative merits of massaging and of tumbling, and the advantages of vacuum-tumbling). A list of equipment suppliers is included. [See FSTA (1980) 12 5S714.] AJDW

42

[Possibilities of mechanical transfer of products into cold-smoking and ripening chambers.] Möglichkeiten der mechanischen Beschickung der Kaltrauchkammern und Reiferäume.

Gersdorf, F.; Schmidt, L.; Törpe, -.; Kiessling, L; Raeuber, H.-J.

Fleisch 33 (9) 171–173 (1979) [De] [Tech. Univ., Dresden, German Democratic Republic]

In a meat-processing plant dry sausages were formerly loaded manually onto and off racks mounted on a trolley at every transfer between stages of processing; smoking was achieved by means of sawdust smouldering in a container. A new procedure introduced at this plant is described, based on use of a stackable trolley, on which rack modules may be transported, each batch of sausages remaining on the same rack module throughout processing. Smoke production was centralized. These improvements have increased plant capacity and reduced labour requirements. IN

43

Thirteenth session of the Codex Committee on fish and fishery products. Recommended international code of practice for smoked fish.

Food & Agriculture Organization, FAO/WHO Codex Alimentarius Commission; World Health Organization, FAO/WHO Codex Alimentarius Commission

FAO/WHO Food Standards Programme ALINORM 79/18, Appendix VII, 31pp. (1979) [En] [Rome, Italy]

This code of practice contains technological guidelines and essential hygiene requirements for processing, handling, storage and distribution of smoked fish and smoked fish products. It does not give specific information on particular smoking procedures for specific species of fish. [See also preceding abstr.] AL

44

A new method for reducing smoking and cooking times for Brühwürstchen (Wieners).

Kresse, K.

Fleischwirtschaft 59 (9) 1224, 1226–1228 & 1306–1307 (1979) [En, de] [Moguntia Werke Mainz, Postfach 3248, 6500 Mainz 1, Federal Republic of Germany]

A new smoking procedure for frankfurter-type sausages is described which reduces the time by 30%. Small-calibre 'Wieners' (22/24 casings) were made from 100% beef, 100% pork or a 50:50 mixture, and smoked and cooked by the usual method (at 50°, 60°, 70° and 76°C for a total of 90 min), or at 76°C throughout for a total of 52 min with addition of moisture after 25 min and drying (evacuation for 2 min) after 35 min. Photographs of the products, and diagrams of the smoking programmes and core temp. show that the new procedure entails no quality deterioration (faulty reddening or reduced colour intensity). The higher temp. ensures faster rise in core temp., addition of moisture during smoking improves heat transfer, smoking losses and solution of smoke components. The amount of reddening aid (ascorbic acid) should be increased to 2 g/kg sausage mixture, and it should be added at the start of grinding in the cutter (with pH drop by 0.2). No negative effect on water binding was observed. A sausage mixture with high myoglobin content is recommended for the shortened process. RM

45

[Experience with the type 301 steam-type smoke generator in Brühwurst sausage manufacture.] Erfahrungen mit dem Einsatz der Dampfrauchanlage Typ 301 im Bereich der Brühwurstherstellung.

Zweig, K.; Schossig, H.

Fleisch 33 (9) 173–174 (1979) [De]

Operation of the type 301 smoke generator is described. Wood chips are treated with dry superheated steam at 320–400°C; this gives a dry distillation of wood constituents without burning or smouldering. The temp. range used gives an optimum yield of desirable smoke constituents, and a min. yield of carcinogenic compounds. Smoke temp. in the smoking chamber is 80°C. Practical advantages of the system include shorter treatment times, improved yield, and considerable flexibility of plant layout. Performance is better than that of Thermax smoke generators, although higher standards of operation and maintenance are required. IN

46

[Modern manufacture of Brühwurst sausages, with minimal pollution of the environment.] Moderne Brühwurstkonservierung im Hinblick auf eine geringe Umweltbelastung.

Dietrich, H.

Fleischerei 30 (9) 741, 743–744, 746–747 (1979) [De] [Wilhelm Fessmann GmbH & Co., Postfach 360, D-7057 Winnenden, Federal Republic of Germany]

Smoking of Brühwurst sausages is discussed, with special reference to measures for control of environmental pollution. Aspects considered include: aims of smoking (modification of colour, aroma and flavour, improvement of keeping quality); effects of the particulate and the gaseous components of smoke; smoked colour formation; the preservative and antimicrobial action of smoke; smoke generation methods (smouldering, superheated steam jet treatment of wood, fluidized-bed smoke generation, friction-type smoke generation, liquid smoke); carcinogenic hydrocarbons in smoke; disposal of waste smoke by combustion methods; and practical aspects of smoking of sausages of small diam. AJDW

47

[Integrated processing of bones in Poland.]
Krokha, Yu. A.; Boltenkov, I. M.; Faivishevskii, M. L.
Myasnaya Industriya SSSR No. 10, 37-41 (1979) [Ru] [Ministerstvo Myasnoi i Molochnoi Promyshlennosti USSR, USSR]

Methods of processing of bones for food and technical applications in Poland are described, and data are given for the performance of equipment for removal of meat residues, boning of sub-standard poultry and use of the resulting meat in smoked products, canned products and meat pastes. An integrated process is described, which produces edible fat, meat/fat mass, edible stock and feed flour; yields of these products (% of raw bone wt.) are 6-8, 28-30, 8 and 32-38%, resp. Throughput of the equipment is 700 kg/h; it is operated by 8 workers. Economic aspects of bone processing are discussed. STI

48

Quick smoker.
Wojahn, H. F.
United States Patent 4 175 485 (1979) [En]

A portable food smoker incorporates a cast Al base and a lid, of generally dome-shaped configuration. The interior chamber is adapted to receive a drip pan and meat rack supported on base ribs. HBr

49

[New method for production of smoked processed cheese in sausage casing.]
Konovalova, T. M.; Vodolazskaya, E. A.; Kraevaya, N. N.; Zakharova, N. P.
Trudy, Vsesoyuznyi Nauchno-issledovatel'skii Institut Maslodel'noi i Syrodel'noi Promyshlennosti No. 23, 118-126, 152 (1978) [Ru] [VNIIMiSp, Uglich, USSR]

In development of a method for production of smoked processed cheese in sausage casing using liquid smoke preparations instead of traditional smoking, extensive tests were carried out in which cheeses with 30 or 40% fat in DM made traditionally and waxed were compared with cheeses made with addition of different quantities of MINKh, VNIIMP (both being smoke condensates) and VNIIMP-1 (synthetic) liquid smoke preparations, packaged in a protein OK casing of 60 mm diam. with either a VIM coating (a layer formed from mixture of aqueous dispersion of BK butyl rubber and vinylidene chloride/vinyl chloride copolymer, and a protective layer of cheese wax), or of poviden (Saran-type) film. VNIIMP liquid smoke added at 0.5-0.6% of the cheese at the end of melting, filling of the mass at 60-65°C into 40-45 cm long casings and use of either of the 2 coatings were finally recommended. Storage tests with such cheeses for ≤120 days at 8-10°C showed that they maintained their original quality better than control cheeses. A line for industrial production of cheeses by the liquid smoke method is diagrammatically presented, and recommended on the basis of tests carried out in the Volgograd dairy factory. SKK

50

Changes in the oxidation-reduction potential (Eh) of smoked and salted fish during storage.
Huss, H. H.; Larsen, A.
Lebensmittel-Wissenschaft und -Technologie 13 (1) 40-43 (1980) [10 ref. En] [Tech. Lab., Min. of Fisheries, Building 221, Tech. Univ., 2800 Lyngby, Denmark]

Eh and associated microbiological and biochemical changes in hot-smoked herring, cold smoked salted and unsalted cod and dry-salted mackerel were examined. Eh of freshly smoked fish products was positive (+100 to +250 mV). During subsequent storage at 15-17°C the Eh remained positive if trimethylamine oxide (TMAO) reducing bacteria were eliminated (by hot-smoking as carried out in this experiment) and when post processing contamination was prevented or growth of spoilage bacteria inhibited by salting (>6.0% NaCl in aqueous phase). The Eh dropped to negative values as a result of bacterial reduction of TMAO to trimethylamine (TMA), a change associated with loss of organoleptic acceptability. The surrounding atm (available O_2) did not influence the Eh of hot-smoked herring, as TMAO-reducing organisms also grew well under anaerobic conditions. AS

51

Chemical effects of smoke processing on Frankfurter quality and palatability characteristics.
Sink, J. D.; Hsu, L. A.
Meat Science 3 (4) 247-253 (1979) [19 ref. En] [Meat Lab., Dep. of Food Sci., Pennsylvania State Univ., University Park, Pennsylvania 16802, USA]

Frankfurters were made by conventional techniques in Visking Nojax casings. 4 smoke treatment methods were compared: (i) conventional solid smoke aerosol; (ii) liquid smoke aerosol; (iii) liquid smoke external dip; or (iv) liquid smoke internal mix. (v) control samples received no smoke treatment. The sausages were then peeled, packaged, and stored for ≤3 wk at 5°C. Quality characteristics studied were overall acceptability, flavour, tenderness, shear force, juiciness score, free water area, smokiness, pigment ratio (cured/total), reflectance ratio (650/570 nm), extinction ratio (570/650 nm), pigment oxidation %, and pigment ring destruction %. The results are discussed in detail. All smoking treatments gave acceptable results; (i), (ii) and (iii) were awarded the highest scores for flavour, and (i), (ii) and (v) were awarded the highest scores for sensory tenderness. Shear values were highest for (ii) and (iii). (ii), (iii) and (iv) gave the best cured colour, (iv) giving the highest colour stability. Storage times over the range studied had little effect on palatability. AJDW

52

Lecithinase and toxin production in *Bacillus* species.
Obi, S. K. C.
Zentralblatt fur Bakteriologie, 1A 246 (3) 415-422 (1980) [8 ref. En, de] [Dep. of Microbiol., Univ. of Nigeria, Nsukka, Nigeria]

Association between production of lecithinase and toxin by *Bacillus* spp., and temporal synthesis of toxin and lecithinase in *B. pumilus* were examined. 96 *Bacillus* strains were isolated from 30 samples of smoked meat, locally prepared in Nigeria. These were identified as belonging to the following spp.: *B. licheniformis, B. pumilus, B. subtilis, B. megaterium*, and *B. polymyxa*. Levels of lecithinase and toxin production are tabulated for each species. 88 of 96 strains produced lecithinase, and 54 of 96 produced toxin. All those that produced toxin produced lecithinase, but not all those strains that produced lecithinase also produced toxin, except for *B. pumilus* (20 of 24 strains produced both, the rest neither). Max. lecithinase production by *B. pumilus* precedes max. toxin formation, although both are detectable within 3 h of incubation. DIH

53

Smoke generator.
West, C. W.
British Patent 1 558 287 (1979) [En]

A closed chamber smoke generator is described for smoking foods without introducing outside air, which employs a smoke chamber positioned above the apparatus for conducting the destructive distillation of sawdust. IFT

54

[Quality and storage characteristics of hot-smoked fishery products. I. Organoleptic and microbiological quality of freshly smoked halibut, 'Buckling' herrings and eels.] Qualität und Lagerverhalten heiss geräucherter Fischereiprodukte. I. Sensorische und mikrobiologische Beschaffenheit von rauchfrischem Heilbutt, Bückling und Aal.
Karnop, G.
Deutsche Lebensmittel-Rundschau 76 (2) 42–47 (1980) [4 ref. De, en] [Inst. für Biochem. & Tech., Bundesforschungsanstalt für Fischerei, Hamburg, Federal Republic of Germany]

Studies were conducted on the organoleptic properties and microbiological quality of smoked (i) Greenland halibut (*Reinhardtius hippoglossoides*, 29 samples); (ii) 'Buckling' herrings (24 samples), and (iii) eel (12 samples) from 9 smoking plants. Tables of data are given for sensory scores for colour, condition and aroma of the skin, the colour, condition, aroma, taste and consistency of the flesh, and microbial counts. 62% of (i) samples, 75% of (iii) samples but only 53% of (ii) were graded organoleptically good to excellent. Microbiological quality of (i) was frequently poor, 3.5% having aerobic bacterial counts of 10^6–10^7/g, and $>51\%$ having counts $>10^4$/g. Counts in (i) were highest near the hole made by the spit on which they were smoked. Microbiological quality of (ii) and (iii) was good. A high proportion of samples, especially (ii) samples, were considered to be insufficently smoked. [See following abstr. for part II.] AJDW

55

[Quality and storage characteristics of hot-smoked fishery products. II. Storage dependent organoleptic changes in halibut, 'Buckling' herrings and eels.] Qualität und Lagerverhalten heiss geräucherter Fischereiprodukte. II. Lagerungsabhängige sensorische Qualitätsveränderungen von Heilbutt, Bückling und Aal.
Karnop, G.
Deutsche Lebensmittel-Rundschau 76 (3) 75–81 (1980) [5 ref. De, en, fr] [Inst. für Biochem. & Tech., Bundesforschungsanstalt für Fischerei, Hamburg, Federal Republic of Germany]

Studies on changes in the organoleptic properties of freshly-smoked (i) Greenland halibut (29 samples), (ii) Buckling herrings (24 samples) and (iii) eels (12 samples) during storage in open or closed wooden boxes are described. Samples were stored at constant temp. of 6°, 12° or 20°C, or temp. fluctuating over this range, until spoilage occurred. Data are given for the shelf life of the fish, changes in overall organoleptic scores of the fish during storage, and the relation between sensory score and commercial acceptability. Storage life decreased with increasing storage temp. for all 3 spp. The shelf life of (iii) was considerably greater than that of (i) or (ii); that of (ii) tended to be greater than that of (i). Shelf-life tended to be slightly less in open than in closed boxes. Deterioration of (i) was most rapid at the site of the hole made by the spit on which the fish were smoked. Spoilage rate increased by a ratio of 1:2 over the temp. range 6–12°C for (i) and (ii), vs. a ratio of 2:3 for (iii). Implications of these results for storage, distribution and retailing of smoked fish are discussed. [See preceding abstr. for part I.] AJDW

56

[Bacterial contamination of cured meat products.]
Mourey, A.; Bracquart, P.
Medecine et Nutrition 15 (6) 431–436 (1979) [9 ref. Fr, en] [Lab. de Microbiol. Alimentaire, Inst. Univ. de Tech., Biol. Appliquee, Le Montret-54600 Villers-les-Nancy, France]

The microbiological quality of a total of 487 samples of cured meat products (113 samples of raw, 233 samples of cooked and 141 samples of smoked products) from 2 manufacturers was studied. Tables of data are given showing counts of aerobic mesophiles, aerobic psychrotrophs, coliforms, *Escherichia coli*, sulphite-reducing anaerobes, faecal streptococci, and *Staphylococcus aureus*. Values for the % of raw samples failing to comply with tolerances for various groups or spp. of bacteria were: *E. coli* 8.8; sulphite-reducing anaerobes 0.9; and *Staph. aureus* 1.8. Corresponding values for cooked products were: aerobic mesophiles 56.2; *E. coli* 15.9; sulphite-reducing anaerobes 4.3; and *Staph. aureus* 5.2. Corresponding values for smoked products were: aerobic mesophiles 51.1; *E. coli* 2.8; sulphite-reducing anaerobes 4.3; and *Staph. aureus* 8.5. No salmonellae were detected in any product studied. Differences in microbiological quality between products from the 2 manufacturers are briefly discussed. AJDW

57

[Study of heat and mass transfer during drying of sausages with the aim of intensification, optimization and automation of the process.] [Lecture]
Lykova, A. V.; Rogov, I. A.; Slepykh, G. M.; Vinitskaya, A. A.
Proceedings of the European Meeting of Meat Research Workers No. 24, F11:1–F11:6 (1978) [6 ref. Ru, de, en, fr] [Moskovskii Tekh. Inst. Myasnoi i

Molochnoi Promyshlennosti, Moscow, USSR]

The process of sausage drying consisting of transfer of moisture within the sausage, vapour formation, and vapour transfer from surface to environment through the border layer formed by the casing is described by a system of differential equations. Data on porosity of natural casings from beef large and small intestines and from pig small intestines with or without salt are presented; and relationships between benzo[a]pyrene penetration into sausages during smoking and type of casing are considered. [See FSTA (1980) 12 8S1280.] SKK

58

[Relation of a_w-values to physicochemical and biochemical characteristics of dry-smoked sausages.]
Abhängigkeit des a_w-Wertes von physikal-chemischen und biochemischen Kennzahlen der Rohwurst. [Lecture]
Mikhailova, M. M.; Tsyss, E. F.; Likhonosova, N. D.; Krylova, V. V.; Mirzoeva, V. Sh.; Stratilatova, N. P.; Vasil'ev, V. G.; Solodovnikova, G. I.
Proceedings of the European Meeting of Meat Research Workers No. 24, G18:1-18:6 (1978) [4 ref. De, en, fr, ru] [Vses. Nauchno-issled. Inst. Myasnoi Promyshlennosti, Moscow, USSR]

Partly-dried smoked sausages injected with an acidophilus bacterial preparation or not injected were examined, samples being studied before injection and 17 and 30 days later; a_w, titratable acidity, pH, and contents of moisture, salt, volatile fatty acids, and lactic acid were determined, and microbiological examination was carried out. Relationships between a_w and the other variables measured are graphically presented, and regression equations are given. a_w was directly related to moisture content and pH and inversely related to contents of salt, lactic acid and volatile fatty acids, and to titratable acidity. The extent of correlation depended on use of starter and on initial bacterial count. [See FSTA (1980) 12 8S1280.] SKK

59

[Quality and nutritive value of pig meat products smoked or treated with a liquid smoke preparation.] [Lecture]
Krylova, N. N.; Karmyshova, L. F.; Balabukh, A. A.; Kolesnikova, V. T.; Khlamova, R. I.; Solov'eva, L. I.; Petrakova, A. N.
Proceedings of the European Meeting of Meat Research Workers No. 24, J9:1-J9:6 (1978) [11 ref. Ru, de, en, fr] [Vses. Nauchno-issled. Inst. Myasnoi Promyshlennosti, Moscow, USSR]

Hams taken from chilled pig carcasses 48 h after slaughter were pickled by brine injection and brine immersion for 5 days at 4-5°C, were then either (i) immersed and held in a liquid smoke preparation (no details given) or (ii) smoked traditionally, and were then heat treated at 85-95°C for 6-8 h to attainment of internal temp. of 70-72°C (without smoke for (i) and with smoke for (ii)). Contents of protein, fat, moisture, ash, constituent amino acids, constituent fatty acids, carbonyl compounds, and phenols were determined in (i) and (ii); in-vitro protein digestibilities were measured; and organoleptic assessment was carried out. It is concluded from tabulated and stated results that there were no substantial differences between (i) and (ii) in the characteristics studied, except that (i) showed better in-vitro protein digestibility than (ii). [See FSTA (1980) 12 8S1280.] SKK

60

Electrostatic principles applied to smoking technology.
Alexander, A.
Food, Flavourings, Ingredients, Packaging and Processing 1 (5) 31-32 (1980) [En]

The flavour manufacturer, White Stevenson Ltd., and the electrostatic spray equipment manufacturer, Volstatic Coatings Ltd., in conjunction with Stewart Gill & Co. Ltd. producers of overhead conveying systems, have launched a continuous electrostatic spray smoking system. White Stevenson can offer a range of 6 Purasmoke extracts, which can be applied to bacon, ham, chicken and turkey, comminuted meat products, fish, cheese and snack foods. Both bacon and poultry plants consist of an overhead conveyor system to transport the product at constant speed throughout the process. The product is hung on the conveyor, passed through the conditioning chamber where the surface is dried to ensure optimum conditions for application of the smoke extract, then conveyed to an electrostatic spraying booth, then through a drying chamber to stabilize colour and flavour. Total cycle time is approx. 45 min and the smoked product is completely fixed within 2 h. The 4 application systems which have been evolved are described: spinning head spray system, airless spray system, powder spraying, and flavour coating of savoury snacks. With the electrostatic system, min temp. only are applied which reduce this loss in yield to between 0.5 and 1.5% instead of 5-7% by traditional methods. VJG

61

Portable system regenerates smoke.
Anon.
Food, Flavourings, Ingredients, Packaging and Processing 1 (5) 21 (1980) [En]

Disadvantages of the natural smoking process are listed. The development of liquid smoking systems to fulfil different processors requirements is considered with particular reference to Griffiths Royal Smoke. The latter is manufactured only from hickory wood under rigorously controlled conditions. Application is by the Zesti Smoke portable atomizer. The correct particle size is achieved using the specially designed nozzle, which mixes compressed air and liquid smoke in a vortex chamber, producing a fan of atomized smoke from the nozzle cap. Liquid smoking can eliminate most of the problems associated with natural smoking such as long process time, high smoke loss and variable finished product. VJG

62

[Christ Fils S.A.: 3 fermented products: choucroute (Sauerkraut), vinegar, food yeast.]
Mouchet, R.
Industries Alimentaires et Agricoles 96 (9/10) 1003-1019 (1979) [Fr]

The processing lines for manufacture of canned choucroute (including choucroute garnie and choucroute brasserie), beef and pork sausages, smoked lard, gherkins and vinegar, and the biological treatment of the fermented juice from choucroute by yeast (*Hansenula anomala*) by the Societe Christ Fils S.A. are described with the aid of photographs and production data. RM

63

[Lightly smoked Elstergold Edam – a delicatessen product in great demand.] Elstergold-Edamer zart geräuchert – ein gefragtes Delikaterzeugnis.
Walter, A.; Kongehl, K.-H.
Milchforschung-Milchpraxis 21 (4) 89 (1979) [De] [VdgB Molkereigenossenschaft eG Elsterwerda, German Democratic Republic]

A factory at Ortrand, German Democratic Republic, has developed a new smoked var. of Edam cheese, with 45% fat in DM. Cheese which was ripened in film for 28–32 days before smoking had better organoleptic quality than cheese which was ripened for only 20 days. Full ripening before smoking was found to be essential, as ripening after smoking did not improve flavour. Best results were obtained when the cheese was smoked for 96 h at 15–25°C. Temp. >30°C caused deformation and wt. losses of 3–3.5%. Each cheese block (110 × 110 × 280 mm, weighing 3.3 kg) is cut into 2 cylinders of 100 mm diam. and 140 mm length, weighing about 1 kg; the cylinders are packaged in plastics nets and hung in the smoking chamber for 96 h, after which they are vacuum-packaged and put into transport cartons. The 1.3 kg offcuts from each block are dried with salt and made into grating cheese. ADL

64

[Steam-generated smoke for hot and cold smoking.] Dampfrauch zur Heiss- und Kalträucherung.
Fessman, G.; Fessman, K.-D.
Fleischerei 30 (12) 1006–1008 (1979) [De] [Germos Gerhard Fessman KG, Auberlenstrasse 27, D-7012 Fellbach, Federal Republic of Germany]

Use of steam-generated smoke in the meat industry is discussed. Aspects considered include: smoke generation; smoke quality; costs (with reference to energy consumption and processing time); the relatively low concn. of 3,4-benzopyrene and other carcinogenic hydrocarbons in steam-generated smoke; environmental pollution; and practical aspects of use of steam-generated smoke in the meat industry. AJDW

65

[Application of steam-generated smoke in cold-smoking and controlled-environment smoking systems.] Die Anwendung von Dampfrauch an Kalt- und Klimarauch-Anlagen.
Schuldt, P.
Fleischerei 30 (12) 990 (1979) [De] [Alpas – Schuldt & Kohn, Grossenstrasse 11, D-2800 Bremen 1, Federal Republic of Germany]

Use of steam-generated smoke in meat processing plants is discussed, with reference to: advantages and disadvantages of steam generation of smoke; use of steam-generated smoke in open smoking systems; 3-phase smoking in closed systems; smoking times; and energy consumption of smoke generation by means of superheated steam, as compared to that for smoke generation by smouldering of wood. AJDW

66

[Use of 'Contiflo' automatic analyser for testing of meat and meat products. II. Determination of ammonia and phosphate contents in premacerated samples.]
Örsi, F.; Varga, J.; Lasztity, R.
Elelmezesi Ipar 33 (7) 241–245 (1979) [11 ref. Hu, en, de, ru] [Budapesti Müszaki Egyetem Biokemiai & Elelmiszertech. Tanszek, 1111 Budapest, Müegyetem Rakpart 3–4, Hungary]

N and P contents were determined in premacerated samples or raw meat and smoked-cooked meat products (by heating in the presence of 1 g K_2SO_4, 20 ml conc. H_2SO_4, and 5 ml H_2O_2/2 g meat) in a 2-channel system by the 'Contiflo' automatic analyser, and the results were compared with those obtained by standard analytical methods. The detn. of N was based on the Berthelot reaction, in which NH_3 reacts with phenol and phenol derivatives in the presence of a basic hypochlorite. The colour (blue) intensity of the resulting indophenol was measured by its absorption value at 670 nm. The P content was determined by the absorption spectrum of phosphorammonium metavanadate-molybdate heteropolyacid formed by reaction of P with ammonium metavanadate-molybdate reagent. The results show that, for protein detn., the error was within the range −0.61 to +0.31% protein; in phosphate detn., error was within the range −2.5 to +2.3 mg/kg. ESK

67

Enterotoxins of staphylococci from smoked fish and relationship between deoxyribonuclease production and antibiotic resistance. (In '*Abstracts of the XII International Congress of Microbiology*' [see FSTA (1980) 12 10B73].) [Lecture]
Obi, S. K. C.
p. 170 (undated) [En] [Dep. of Microbiol., Univ. of Nigeria, Nsukka, Nigeria]

Production of enterotoxins A, B, C, D and E by 100 strains of *Staphylococcus* isolated from fish samples was investigated by means of the sac-culture method and detected serologically using the plate gel double diffusion technique. All the screened strains were DNAse positive while 72 strains were coagulase positive. 68 of the coagulase positive strains (94%) were enterotoxigenic while 10 of the 28 coagulase negative strains (35.7%) produced enterotoxins. Enterotoxin A was the most frequently detected while enterotoxin D was least frequent. Of the isolates capable of producing >1 enterotoxin, those producing enterotoxins A, B and C were predominant. In another study with 200 staphylococcal isolates from fresh milk a correlation was established between DNAse production and antibiotic resistance. Weakly DNAse positive and DNAse negative isolates proved more resistant to streptomycin, tetracycline and penicillin G than the DNAse positives. AS

68

[Device for grilling or smoking foodstuffs.]
Johansson, K. H.
Swedish Patent Application 408 260 (1979) [Sv]

A device for grilling or smoking foodstuffs, particularly fish, consists of a main container to the upper portion of which there are applied one or more grids supporting the foodstuff. For grilling, the main container is adapted to contain glowing coal and for smoking to contain smoke shavings and/or juniper twigs or the like. W&Co

69

Method for producing wood smoke on a charcoal grille.
Robins, J. S.
United States Patent 4 190 677 (1980) [En]

70

Evaluation of the nutritive value of some lesser known protein sources in Nigerian peasant diets.
Umoh, I. B.; Ayalogu, E. O.; Bassir, O.
Ecology of Food and Nutrition 9 (2) 80-85 (1980) [29 ref. En] [Univ. of Ibadan, Ibadan, Nigeria]

In vitro enzyme digestion and in vivo rat feeding trials were used to evaluate the nutritive value of some Nigerian protein sources. Tabulated results for snail *(Vioipara quadrata)*, periwinkle *(Littorina littorea)*, dried crayfish *(Palamonetes varians)* and locally smoked freshwater fish *(Tilapia melanopleura)* showed digestibilities of 56.7-75.3% by pepsin/trypsin hydrolysis (vs. 96.9% for whole hen's egg), true digestibility of 80.4-91.1% vs. 98.2%, biological value of 70.8-81.6% vs. 91.8%, net protein utilization of 60.3-73.0% vs. 90.1% and protein efficiency ratio of 0.7-1.8 vs. 3.5 by rat feeding trials. Crayfish and freshwater fish showed the highest values throughout. RM

71

Ready-to-serve products from oil sardine.
Muralidharan, V.
Seafood Export Journal 12 (2) 29-30 (1980) [En] [Calicut Res. Cent., Cent. Inst. of Fisheries Tech., Calicut, Kerala, India]

Directions are given for the smoking of oil sardines on a cottage industry scale, and preparation of 3 products (fish fillets, pickle, and chutney powder) from them. CFTRI

72

Effect of processing variables on the methionine content of frankfurters.
Strange, E. D.; Benedict, R. C.; Miller, A. J.
Journal of Food Science 45 (3) 632-634, 637 (1980) [En] [USDA E. Reg. Res. Cent., SEA-AR, 600 East Mermaid Lane, Philadelphia, Pennsylvania 19118, USA]

Effects of processing and use of pro-and antioxidant additives on methionine content of frankfurters were examined. Emulsification and cooking-smoking had no significant effect on the methionine content, but high peroxide fat or sodium ascorbate lowered the methionine content of the raw emulsions, presumably by oxidation. Cooking-smoking acted to restore the methionine level. Interaction of spice and nitrite on methionine levels was significant. Cooking and/or spices reduced the peroxide numbers of the frankfurters. IFT

73

[Separation and analysis of phenol fractions from smokehouse smoke. I. Aim of the study, survey of literature and laboratory apparatus for smoke production and pyrolysis.] Präparative Gewinnung und Analyse von Phenolfraktionen aus Räucherrauch. I. Aufgabenstellung, Literaturübersicht und Laborgeräte zur Entwicklung und Pyrolyse von Rauch.
Toth, L.
Fleischwirtschaft 60 (3) 461-466 (1980) [42 ref. De, en] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

In order to evaluate the health hazards of smoking of foods especially the use of smoke preparations, condensed smoke should be separated into analytically defined fractions and subjected to toxicological examination. Tests on phenolic compounds are regarded as particularly urgent. Although 58 phenols have been identified to date, quantitative information is scarce. 2 types of laboratory smoke generators were constructed to allow study of the effects of smoking technology on the formation of phenols: a smoke generator with smoke production at >400°C and up to 1000-1200°C (±50°C); and a pyrolysis unit with condensation of the products in cold traps or wash bottles. [From En summ.] RM

74

[Use of shark meat as food.] Die Verwendung von Haifischfleisch in der Ernährung des Menschen.
Maciejczyk, J.
Zywieni Czlowieka 6 (4) 241-244 (1979) [5 ref. Pl] [Zaklad Tech. Rybnej, Morskiego Inst. Rybacki, Gdynia, Poland]

The possible use of shark meat as food in Poland is discussed, with special reference to problems with fish supplies as a result of fishery regulations and limits. Protein content is approx. 21%; protein digestibility is 92-95%. Moisture, fat and ash contents are approx. 74%, 4% and 1.5% resp. Concn. of vitamins A, B and D are relatively high. The liver contains 50-80% fat. The potential for use of shark meat in manufacture of soups, fish balls, fish sausage and smoked products is briefly considered. The main defect of shark meat is the high content of urea, which gives a sharp, bitter/acid taste, and may lead to swelling of cans as a result of thermal decomposition of the urea. The urea taste may be controlled by immediate bleeding of the fish, washing, and acid treatment. Fried, boiled, marinated and smoked shark products and shark meat in aspic are manufactured in Poland. IN

75

[Quality and storage quality of hot-smoked fish products. III. Microbiology and effects of intensity of smoking on the keeping quality of halibut, buckling and eels.] Qualität und Lagerverhalten heiss

geräucherter Fischereiprodukte. III. Mikrobiologie und Einfluss der Räucherintensität auf die Haltbarkeit von Heilbutt, Bückling und Aal.
Karnop, G.
Deutsche Lebensmittel-Rundschau 76 (4) 125–134 (1980) [6 ref. De, en, fr] [Inst. für Biochem. & Tech., Bundesforschungsanstalt für Fischerei, Hamburg, Federal Republic of Germany]

Studies on 29 batches of (i) Greenland halibut, 24 batches of (ii) buckling herrings and 12 batches of (iii) eels, produced by 9 smoking plants, are described. The fish were stored for various periods in either open or closed wooden boxes at temp. of 6°, 12° or 20°C, or at oscillating temp. (6°C at night, 12° or 20°C during the day). Tables of data are given for total aerobic bacterial counts and the microflora of the fish, the storage life before mould growth, the relation between initial bacterial count and quality deterioration, and the relation between intensity of smoking and rate of quality deterioration. Bacterial count was the primary factor limiting the storage life of (i); an increase in bacterial count by a factor of 10^2 reduces shelf-life by a half or more. Shelf-life of (ii) and (iii) is limited primarily by mould growth, which precedes sensory changes. The intensity of smoking is a major factor influencing the shelf-life of (ii) and (iii), but not that of (i). Effects of temp. on keeping quality are considered; storage and distribution of smoked fish at temp. <6–7°C is recommended. The possibility of establishment of bacteriological standards for (i) is briefly considered. Spoilage of (i) was mainly due to a putrefactive *Pseudomonas/Aeromonas* flora; Enterobacteriaceae may grow at the higher storage temp. [See FSTA (1980) 12 8R457 for part II.] AJDW

76

[Smoked fish product.]
Matsumura, S.
Japanese Examined Patent 5 506 338 (1980) [Ja]

A process is described in which bonito and other fish are processed to yield a soft delicious smoked meat in which the pigment is stabilized. The fish is treated with sodium bicarbonate, disodium hydrogen phosphate, sorbate and salt, after which it is washed, dried and smoked. IFT

77

[Process for coating of raw sausages with desirable moulds.] Verfahren zur Beauflagung von Rohwurst mit Edelschimmel.
Schreinert, F.
German Democratic Republic Patent 140 612 (1980) [De]

A procedure for application of ripening mould cultures to raw dry sausages is described, in which dried milk is added to the mould culture. This stimulates mould growth but inhibits yeast growth on the sausages; the increased viscosity of the culture improves adhesion of the culture to the surface of the sausage. This technique is suitable for use with smoked raw sausages, or with rapid ripening processes. Use of the procedure increases the acceptable variation in ripening conditions. IN

78

Recycles smoke – needs no stack or emission controls.
Mosle, K.; Robe, K.
Food Processing 40 (2) 96–97 (1979) [En]

A smokehouse installation producing European-style smoked sausage and ham products using a smoke recycling system is described. The plant incorporates automatic control and sensing of RH and product core temp. Smoke temp. and sawdust burning rates are lower than with conventional systems. JRR

79

Influence of generation temperature on the chemical composition, antioxidative, and antimicrobial effects of wood smoke.
Fretheim, K.; Granum, P. E.; Vold, E.
Journal of Food Science 45 (4) 999–1002, 1007 (1980) [En] [Norwegian Food Res. Inst., PO Box 50, N-1432 As-NLH, Norway]

Smoke was generated at temp. ranging from 350 to 500°C. To determine the optimum temp. for smoke generation, smoke condensates were subjected to chemical analyses and investigations of their antioxidative and antimicrobial effects. The 150°C increase in generation temp. did not significantly alter the composition of the smoke condensates beyond reducing the concn. of active components by about 35%. Taking the effect on concn. into account, the antioxidative effect increased only very slightly with generation temp.; the antimicrobial effect of the smoke condensates appeared not to be influenced. Since the higher generation temp. yielded more smoke at a higher rate the optimum temp. is about 400°C. IFT

80

Smoking process.
Saurenman, D. G. (Consan Pacific Inc.)
United States Patent 4 208 438 (1980) [En]

A method is described of enhancing the smoke treatment of foods in which a high voltage is applied to the zone where the food and smoke are located to ionize smoke particles causing them to be attracted to the upper side of the food. IFT

81

[Effect of smoking method on quality of salami-shaped processed cheese.]
Ul'yanov, S. D.; Shilyaev, V. V.; Gavrilova, N. B.
Molochnaya Promyshlennost' No. 12, 36–37 (1979) [4 ref. Ru] [Semipalatinskii Filial Dzhamb'ulskogo Tekh Inst., USSR]

Processed cheese with 30% fat was smoked at 50 ± 5°C for 8 h in a smoke chamber or treated with 0.6% smoke preparation added at the end of the processing stage. The results of tests during storage showed that the cheese made with the addition of the preparation kept better and contained fewer bacteria (1050 million/g) than the cheese smoked with natural smoke (1.250 million/g). This difference is attributed to better dispersion in the former of the phenol compounds and of other organic substances which give the product the flavour and aroma and possess bactericidal properties. In naturally smoked cheese the smoke penetration was only to a depth of 1–1.5 cm. FL

82

[Studies on the free organic acids in katsuobushi.]
Tsuyuki, H.; Abe, T.
Bulletin of the College of Agriculture and Veterinary Medicine, Nihon University [Nihon Daigaku Nojoigakubu Gakujutsu Kenkyu Hokoku] 37 (55) 312–318 (1980) [15 ref. Ja, en] [Coll. Agric. & Vet. Med., Nihon Univ., Tokyo, Japan]

Free organic acids were determined by silica gel column chromatography in skipjack katsuobushi at various stages of processing (fresh fish, boiled, smoked and moulded intermediate stages of processing, and the finished product). Tables and graphs are given showing changes in concn. of n-butyric, isobutyric, propionic, acetic, formic, succinic, lactic, pyroglutamic, glycolic, malic and citric acids during processing. Total organic acid content in the final product was 1172.0 mg% DM basis; the predominant free organic acids were citric, malic and glycolic (resp. 27.2, 18.6 and 12.1% of the total organic acids). Data are also given for organic acid concn. in a commercial sample of katsuobushi. Total organic acid content was 1774.7 mg%; the same acids predominated as in the experimental sample. [From En summ.] AJDW

83

[Effects of storage temperature on the keeping quality of smoked halibut, buckling and eels.] Der Einfluss der Lagertemperatur auf die Haltbarkeit von geräuchertem Heilbutt, Bückling und Aal.
Karnop, G.
Informationen für die Fischwirtschaft 27 (3) 125–128 (1980) [3 ref. De] [Inst. für Biochem. & Tech., Hamburg, Federal Republic of Germany]

Studies were conducted on the keeping quality of smoked (i) halibut, (ii) buckling herrings and (iii) eels, stored in open or closed wooden boxes at constant temp. of 6°, 12° or 20°C, or temp. fluctuating within this range. Organoleptically evaluated storage life decreased with increasing storage temp.; an increase from 6° to 12°C doubled the rate of sensory deterioration of (i) and (ii), but increased deterioration rate of (iii) only in the ratio 2:3. (i) spoiled mainly by bacterial growth; (ii) and (iii) spoiled mainly by mould growth. In all 3, rate of microbial spoilage doubled with an increase in storage temp. from 6° to 12°C. Little deterioration was observed during brief storage (e.g. 1 day) at 20°C. The importance of bacterial contamination at the site of the spit on which (i) are smoked is stressed, together with the role of circulating air as a source of mould spores. Intensity of smoking is also of importance for keeping quality. The relative significance of the variables considered for the storage life of (i), (ii) and (iii) is discussed, and brief recommendations concerning storage conditions are given. AJDW

84

Curing and smoking of rabbit meat.
Owen, J. E.; Ison, R. W.; Nicolaides, L.; Reilly, A.; Silverside, D.
Tropical Science 21 (1) 11–31 (1979) [41 ref. En, fr, es] [Tropical Products Inst., 56/62 Gray's Inn Road, London WC1X 8LU, UK]

A series of experiments was carried out to investigate the processing of rabbit meat by both cold and hot curing, and also smoking. In the first 3 experiments chilled and frozen rabbit carcasses were used; in the last experiment warm pre-rigor carcasses were used. Microbiological, chemical and organoleptic data were collected on the carcasses. Although the hot curing method produced lower yields after processing, it produced meat which appeared to be of a higher organoleptic quality than the cold cured meat. Bacterial numbers were not high on the meat after curing and were virtually eliminated by smoking. Of particular importance was the fact that no food poisoning organisms were isolated. These studies indicate that an acceptable product could be obtained by the hot curing of pre-rigor rabbit carcasses, without the need for refrigeration in the processing stages. AS

85

[Method of producing liquid smoke.]
Goblik, V. F.; Filimonov, A. V.; Kotsur, V. G.; Repnyakova, V. A.; Mel'nikova, L. M.; Kovach, L. I.; Gorbatov, V. M.; Volovinskaya, V. P.; Krylova, N. N.; Lyaskovskaya, Yu. N. **(Union of Soviet Socialist Republics,** Vsesoyuznyi Nauchno-issledovatel'skii Institut Myasnoi Promyshlennosti)
USSR Patent 179 180 (1979) [Ru]

Condensate from the smoke of hardwoods is distilled, and the distillate is collected with subsequent adsorption and desorption of the smoke components. For improved purification of the liquid from harmful impurities, and fuller utilization of the condensate, the distillate is collected as 2 fractions; the components are adsorbed and desorbed from the 1st fraction, the 2nd being mixed with the desorbed components. W&Co

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H. BROOKES

EDITOR

1

[Analysis of polycyclic aromatic hydrocarbons.]
Analytik der polycyclischen aromatischen Kohlenwasserstoffe. [Lecture]
Grimmer, G.
Landwirtschaftliche Forschung Sonderheft 35, 683-699 (1979) [19 ref. De, en] [Biochem. Inst. für Umweltcarcinogene, Sieker Landstrasse 19, D-2070 Ahrensburg, Federal Republic of Germany]

After reviewing the incidence and carcinogenic effects of polycyclic aromatic hydrocarbons (PAH), the author discusses analytical problems, i.e. methods for complete extraction, enrichment (liquid-liquid distribution, adsorption or partition chromatography), and separation (capillary GLC, high-performance GLC, HPLC). The glass capillary gas chromatograms and enrichment scheme for fractions from smoked herrings are shown as examples. Applications of PAH profile analysis in food analysis are listed. [See FSTA (1981) 13 1A3.] RM

2

[Casings for smoked meat products and cheeses.]
Jats, O.; Valenta, V.; Lukes, E.; Michetschläger, M.; Pribik, I.
Czechoslovak Patent 169 612 (1980) [Cs]

The casing is manufactured from bonded unwoven fabric from natural and artificial fibres 2.5-50 mm long fused together by partial parchmentization and pressing using film-forming materials. The casing possesses a high strength, elasticity, stretchability and tear resistance. STI

3

Application of 5'-ribonucleotides to foods. II. Studies of the stability of 5'-ribonucleotides in sausage.
Ishii, K.; Takagi, S.; Nakao, Y.
Journal of Japanese Society of Food Science and Technology [Nippon Shokuhin Kogyo Gakkaishi] 26 (2) 95-100 (1979) [En, ja] [Food Res. Lab., Food Products Div., Takeda Chem. Ind. Ltd. Juso-Honmachi, Yodogawa-ku, Osaka, Japan]

Effects of processing conditions in meat products, particularly sausages, on stability of added 5'-ribonucleotides were studied. In unsmoked sausages, the internal temp. increased rapidly over a short period so that added 5'-ribonucleotides were very stable. In smoked sausages, stability of 5'-ribonucleotide depended on smoking conditions; degree of decomposition was lower in wieners than frankfurters and bologna. 3 methods were studied for increasing the stability of 5'-ribonucleotides during the smoking process, these were: coating 5'-ribonucleotides with hydrogenated vegetable oil; adding polyphosphate to sausages; and adding glucono-δ-lactone to sausages followed by HTST smoking. All 3 methods were found to be effective. [See preceding abstr. for part I.] SP

4

[Purification of coffee-roasting smoke.]
Anon.
Genie Industrial Engineering Actualites No. 93, 37-39 (1979) [Fr]

The Ufima coffee-roasting and conditioning establishments situated in an urban area have 2 drum roasters of resp. 600 and 800 kg/h capacity installed in 1966 and provided with additional smoke-combination compartment constructed by Probat. Smoke contents of organic compounds with and without smoke-combustion were on average resp. 50-60 and 150-200 mg N/m³, with max. values at end of a cycle of 400 and 1500 mg N/m³, purification being about 70% at 450°C, temp. of smoke treatment. In 1974 and 1975, 2 Probat RZ 1500 roasters, and in 1979 1 Probat RZ 2500 roaster of resp. 1200 and 2000 kg/h capacity, were installed. The roasters are described and photographically and diagrammatically illustrated. They incorporate smoke purifiers giving about 85% purification, rising to 95% with inclusion of a catalyser at the chimney entry; hot gas recycling reduces energy consumption to about 45 kWh/100 kg coffee. SKK

5

Effect of water activity and temperature on *Staphylococcus aureus* growth and thermonuclease production in smoked snoek.
Theron, D. P.; Prior, B. A.
Journal of Food Protection 43 (5) 370-373 (1980) [24 ref. En] [Dep. of Microbiol., Univ. of the Orange Free State, PO Box 339, Bloemfontein, S. Africa 9300]

Smoked snoek at different water activity (a_w) values (0.966, 0.956 and 0.944) were inoculated with *Staphylococcus aureus* at a concn. of approx. log 4.7 colony forming units/g (CFU/g) and incubated at different temp. (4, 12, 24 and 37°C) for various periods. Samples of inoculated and control snoek were taken at different intervals to determine the microbial populations (*S. aureus*, total organisms and enterococci), pH and presence of thermonuclease. No growth of *S. aureus* nor thermonuclease production occurred at 4°C. At 12°C, notwithstanding high *S. aureus* log counts of 6.75/g, 9.74/g and 9.69/g in the inoculated 0.966, 0.956 and 0.944 a_w samples, resp., thermonuclease was absent after 21 days of incubation. At 24° and 37°C at all 3 a_w levels, very high *S. aureus* counts were recorded and were accompanied by thermonuclease production before the end of the relative incubation periods (5 and 3 days, resp.). A reduction of the a_w of the snoek resulted in a slightly slower *S. aureus* growth rate at 37°C and also delayed thermonuclease production at 24 and 37°C. The thermonuclease test was an effective means of detecting *S. aureus* growth except in samples incubated at 12°C. *Enterococcus* numbers increased in all control samples during storage, but none were found to produce thermonuclease. AS

6

Formation of methylguanidine, a mother substance of *N*-nitroso-methylcyanamide and *N*-nitrosomethylurea, in smoked-dried skipjack sticks, 'Katsuo-bushi'.
Kawabata, T.; Ino, M.; Ohshima, H.
Bulletin of the Japanese Society of Scientific Fisheries [Nihon Suisan Gakkai-shi] 45 (8) 971-975 (1979) [14 reg. En] [Dep. of Biomed. Res. on Foods, Nat. Inst. of Health, Kamiosaki, Shinagawa-ku, Tokyo 141, Japan]

It has been reported that smoked-dried fish sticks such as 'katsuo-bushi' and 'kezuri-bushi' contain comparatively large quantities of methylguanidine (MG: 18–178 mg/kg). This study aimed to elucidate the mechanism for MG formation in 'katsuo-bushi' and related products. MG and its precursors, creatine (CRE) and creatinine (CRN), were analysed in 'katsuo-bushi' samples obtained at different stages of preparation. Small amounts of MG (1.3–2.9 mg/kg) were detected in boiled and semi-dried fish fillets called 'namari-bushi', although no appreciable amount could be detected in raw skipjack muscles. Moisture content of fish sticks gradually decreased as manufacturing advanced, while in contrast, the MG content of products increased. The degree of catalysis on oxidation of CRE and CRN to give MG observed in the presence of metal pieces such as Cu and Fe was almost negligible, but the presence of certain metallic ions e.g. Cu^{+}, Cu^{2+} and Fe^{3+} apparently enhanced MG formation. This catalytic effect was conspicuous under acidic conditions. MG formation occurring during boiling of fish fillets in an iron kettle or tank seemed to be due to the catalytic action of Fe^{3+} derived from iron-rust. AS

7

[Redox potential of vacuum packaged smoked herring, mackerel and whitefish.]
Wiberg, C.; Nilsson, G.
Var Föda 32 (2) 89–95 (1980) [20 ref. Sv, en] [Biol. Lab., Statens Livsmedelsverk, S-75126 Uppsala, Sweden]

Studies were conducted on the redox potential (Eh_7), determined using a Pt test electrode and a calomel reference electrode, of 11 samples of vacuum-packaged (i) smoked herring (studied from 23 days before to 13 days after the last recommended date for consumption), 15 samples of (ii) smoked whitefish (studied from 22 days before to 6 days after the last recommended date for consumption) and 5 samples of (iii) smoked mackerel (studied from 97 days before the last recommended date for consumption up to the last recommended day for consumption). Tables of results are given. Eh_7 varied irregularly during storage of the fish. Mean values with ranges were, for (i)–(iii) resp. (mV): 223 and 180–285; 237 and 126–286; and 197 and 108–271. The results are discussed in relation to effects of Eh on the likelihood of growth of *Clostridium botulinum* on the smoked fish. AJDW

8

[Housing for rows of fish on sticks.]
Kravtsov, A. D.; Sidorovich, V. V.; Svoyanovskii, V. I.; Pogorilitser, Yu. G. (Union of Soviet Socialist Republics, Opytnoe Proizvodstvenno-tekhnicheskoe Ob"edinenie 'Tekhrybprom')
USSR Patent 713 557 (1980) [Ru]

A housing for distributing rows of fish on sticks for smoking and drying, contains frames with vertical racks, to which are fastened dou ble-walled combs with sockets for stacking the sticks. In order to mechanize the process of loading and unloading, the interior wall of the comb is reinforced, the teeth of the combs are triangular in shape, and wedge-shaped guides are mounted on the vertical wall. W&Co

9

Reduction of sodium nitrate and nitrite during curing and smoking poultry meat.
Singh, R. P.; Mahadevan, T. D.
Indian Journal of Poultry Science 14 (4) 181–184 (1979) [10 ref. En] [Div. of Poultry Res., Indian Vet. Res. Inst., Izatnagar-243 122, India]

Dressed, cut-up chicken was cured for 72 h at 5–6°C (RH 80–85%), and smoked in hardwood smoke for 4 h at 40–45°C (RH 25–30%); it was then stored at room temp. (25–26°C) and under refrigeration (5–6°C). On the 4th day of storage, nitrite content was found to have increased significantly in all the treatments, the increase being greatest under refrigerated storage. On the 8th day of storage, a significant decrease in nitrite content was observed both before and after cooking, the loss being greater in the samples stored at room temp. The cured and smoked chicken had a desirable colour, flavour, and taste. CFTRI

10

Pure cultures, rapid analysis/sampling and precise smokehouse control – keys to high quality.
Gasner, J.; Andres, C.
Food Processing 41 (2) 88–89 (1980) [En] [Bavaria Sausage Kitchens, Madison, Wisconsin, USA]

Close control of summer sausage quality is achieved by use of a frozen concentrated lactic acid bacteria starter culture, control of lean/fat ratios in the meat, and monitoring of the smokehouse operation. JRR

11

The use of combined gas chromatography-mass spectrometry for the identification of aliphatic carboxylic acid in smoke produced from two species of wood.
Klossowska, B. M.
Acta Alimentaria Polonica 5 (3) 301–310 (1979) [15 ref. En, pl] [Inst. of Meat Fat Ind., Warsaw, Poland]

Modern methods of GLC-MS were used to identify carboxylic acids in smokes produced by burning grey alder (*Alnus incana* L.) and silver fir *(Abies alba)* sawdusts (to prepare smoke flavouring). The smoke was absorbed in $CHCl_3$ and acids were isolated by a GLC-MS procedure (details given). Mass spectra (examples shown) were compared with those of known acids from acetic to stearic and some other isomers and unsaturated acids were identified from a registry of mass spectral data. 11 carboxylic acids from alder smoke and 8 from fir smoke are listed; fir smoke contained no acids with chains longer than 5 carbons. Differences are attributed mainly to the particular chemical structures of hemicelluloses and their contents in the 2 wood spp. (alder 18.8%, fir 15.6%). ELC

12

[Determination of sorbic acid, its salts and salicyclic acid in food of animal origin.]
Tsvetkova, Ts.; Grigorova, D.
Veterinarnomeditsinski Nauki 16 (8) 42–49 (1979)
[11 ref. Bg, ru, en] [Tsentralen Nauchnoizsled. VetMed. Inst., Sofia, Bulgaria]

The steam distillation method described in the preceding abstr. proved suitable for subsequent colorimetric detn. of sorbic acid and sodium sorbate in cold-smoked or hot-smoked fish, canned fish or 'Krema' cheese. For colorimetry, a portion of the distillate was mixed with an equal vol. of a 1:1 mixture of 0.01N potassium dichromate and 0.3N H_2SO_4, the whole was heated in a boiling water-bath for 10 min, 0.5% solution of thiobarbituric acid was added and, after a further 10 min heating, absorption at 532 nm was measured. Sensitivity of the method was 2 μg. Salicylic acid could be qualitatively detected in another portion of the distillate by formation of violet colour on direct treatment with 1% aqueous solution of ammonium ferric sulphate. SKK

13

[Volatile components of smoked salmon. I.]
Kasahara, K.; Nishibori, K.
Bulletin of the Japanese Society of Scientific Fisheries [Nihon Suisan Gakkai-shi] 45 (12) 1543–1545 (1979) [2 ref. Ja, en] [Notre Dame Seishin Univ., Okayama 700, Japan]

Volatile components of smoked salmon were studied by GLC and GC-MS analysis. 16 phenols, 17 acids, an ester, an alcohol and 3 hydrocarbons were identified. Phenols such as guaiacol, 4-methylguaiacol, 4-ethylguaiacol 2,6-dimethoxyphenol and 4-methyl-2,6-dimethoxyphenol were presumed to be the principle components of aroma of smoked salmon. AS

14

[Volatile components of smoked salmon. II. The relationship between flavours of smoked salmon and smoke-tar.]
Kasahara, K.; Nishibori, K.
Bulletin of the Japanese Society of Scientific Fisheries [Nihon Suisan Gakkai-shi] 45 (12) 1547–1549 (1979) [1 ref. Ja, en] [Notre Dame Seishin Univ., Okayama 700, Japan]

In order to observe the influence of smoke-process on smoked salmon flavour, volatiles of salt salmon and smoke-tar were studied by GC-MS analysis. 16 volatile components (14 acids and 2 hydrocarbons) from salt salmon and 32 volatile components (15 acids, 16 phenols and an ester) from smoke-tar were identified. Phenols found in the smoked salmon aroma were shown to arise in the smoke-process. [See preceding abstr. for part I.] AS

15

[Smoked fish.]
Ninben Co. Ltd.
Japanese Examined Patent 5 518 500 (1980) [Ja]

Fish pieces are immersed in a sugar solution containing ethanol, after which they are dried in an air stream and smoked in 2 stages. IFT

16

[Water activity of animal fats.] Die Wasseraktivität von Fetten tierischer Herkunft.
Rödel, W.; Krispien, K.; Leistner, L.
Fleischwirtschaft 60 (4) 642, 644–648, 650; 717 (1980)
[many ref. De, en] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

The importance of water activity (a_w value) for the storage stability of fatty animal tissues, and the effects of technological processes (chilling, salting, curing, drying etc.) on a_w are reviewed. Tabulated data from analyses of 46 samples showed a_w of 0.996–0.991 in untreated hot samples, with moisture contents (m.c.) 9.6–26.9%. While samples with higher m.c. also had higher a_w, there was no direct relationship between the 2 parameters. Chilling, curing, smoking and air drying in various combination reduced a_w to 0.95–0.70; rendering reduced a_w to <0.40–<0.24 and m.c. to 0.57–0. Technological treatments increased NaCl from 0.05–0.20% to a max. of 3.3%. pH of all samples varied from 5.5 to 7.3. Because of its high a_w, untreated fatty tissue is as liable to microbial spoilage as fresh meat, but reduction of a_w to 0.95–0.72 as a result of processing ensures good storage stability (due to the low m.c.). Chilling the superficial fatty tissue delays bacterial spoilage and wt. loss of meat, both in carcasses and meat products, due to fall in a_w. The a_w can also be used to classify foods into highly perishable ($a_w > 0.95$ and pH > 5.2), perishable (a_w 0.95–0.91 or pH 5.2–5.0) and foods suitable for storage ($a_w \leq 0.95$ and pH ≤ 5.2 or $a_w < 0.91$, or pH < 5.0), and into high moisture (a_w 1.0–0.90, m.c. 25–100%), intermediate moisture (a_w 0.90–0.60, m.c. 20–50%) and low moisture foods (a_w 0.60–0.00, m.c. 0–20%). RM

17

[Mixture for inhibiting the growth of undesirable microflora in raw smoked sausage.]
Rei, M. K.; Kirikall, V. V.; Klaar, Ya. I.; Luts, V. Kh.; Teemusk, A. R. E. (**Union of Soviet Socialist Republics**, Estonskaya Sel'skokhozyaistvennaya Akademiya; **Union of Soviet Socialist Republics**, Konstruktorsko- tekhnologicheskoe Byuro Ministerstva Myasnoi i Molochnoi Promyshlennosti Estonskoi SSR)
USSR Patent 727 189 (1980) [Ru]

The mixture contains the following ingredients (%): sodium chloride, 79.0–90.99; sodium nitrite, 0.12–0.37; sugar, 3.6–6.1; *Streptococcus diacetilactis* culture, 1.8–3.65; *Lactobacillus plantarum* culture, 1.8–3.65; lactic acid, 1.21–2.43; and sorbic acid, 0.48–4.8. W&Co

18

Microbiological and other effects of pre-cure storag pre-cure freezing, and smoking on dry-cured hams.
Johnson, A. E.
Dissertation Abstracts International, B 40 (10) 4579: Order no. 79-27683, 182pp. (1980) [En] [Univ. of Kentucky, Lexington, Kentucky 40506, USA]

Effects of pre-curing storage (3 or 6 days at 2°C), smoking and ageing (for ≤ 3 months) on microbiological quality and palatability of hams were studied. Aerobic counts were higher for hams held for 6 than for 3 days before curing; this difference decreased during ageing. Smoking decreased surface counts. Counts of enterococci, *Bacillus cereus* and

Pseudomonas spp. were initially low, and decreased during processing to approx. zero after 1 month of ageing. Coliforms were initially present at low counts, but were absent after salt equalization. Staphylococci counts decreased during ageing; few isolates were coagulase-positive. Yeast and mould counts increased gradually during processing and ageing. No *Clostridium perfringens* or salmonellae were detected in fresh hams. Palatability did not differ significantly between hams cured 3 or 6 days post mortem, or between smoked and unsmoked hams. In a second study, uncured hams were examined (i) before freezing, or after frozen storage for 2 months at −2°C and evaluated (ii) unthawed, (iii) thawed in running water at 37°C, or thawed in air at (iv) 2°C or (v) 16°C. Initial counts were highest in (ii), followed by (v), (iv) and (ii). These differences disappeared after curing and salt equalization. Aerobic counts increased up to ageing, then remained constant. Enterococci and *B. cereus* were initially present at low counts, and disappeared after ageing for 1 month; coliforms were not detected after salt equalization. Counts of yeasts, moulds and staphylococci increased throughout processing and ageing. Free fatty acid concn. before curing were highest for (iii) and (iv); after ageing, free fatty acid concn. were lower for (iii) than for (ii) or (v), peroxide values were lower for (ii) than (iv) or (v), and TBA values were lower for (vi) and (v) than (ii) or (iii). (iv) hams were tenderest; (iii) hams were rated lowest for flavour and overall satisfaction. AJDW

19

[Surface moulds in seasoned and matured meat products (bresaola and raw hams).]
Dragoni, I.; Marino, C.; Cantoni, C.
Industrie Alimentari 19 (5) 405–407 (1980) [8 ref. It] [Istituto di Ispezione degli Alimenti di Origine Anim., Univ. degli Studi, Milan, Italy]

Surface moulds found on samples of bresaola (a smoked beef product) were identified as *Penicillium lanosum* and *P. lanoso-griseum*; those on raw hams were identified as *P. frequentans* and *P. lanoso-coeruleum*. The morphological characteristics of the moulds are shown in a series of drawings. HBr

20

[Fungistatic and fungicidal effects of potassium sorbate and smoke preparations on certain moulds.]
Todorovic, M.; Oluski, A.; Skrinjar, M.
Tehnologija Mesa 20 (9) 249–251 (1979) [11 ref. Sh, en] [Tehnoloski Fak., Novi Sad, Yugoslavia]

The effect of 6, 7, 8 and 10% concn. of potassium sorbate, and various smoke preparations (liquid and powdered) on *Mucor christianiensis*, *M. dimorphosporus*, *M. heterosporus*, *M. sciurinus*, *M. vosnessenskii*, *Penicillium concentricum*, *P. verrucosum* var. *cyclopium*, and *P. verrucosum* var. *ochraceus* isolated from the surface of sausages, as well as on mixed cultures of these moulds, was studied. The smoke preparations were without effect, whereas potassium sorbate gave inhibition zones increasing in proportion to concn. The genus *Mucor* was less sensitive than the genus *Penicillium*. The 10% concn. of potassium sorbate gave the most uniform inhibition zones. STI

21

[Polycyclic aromatic hydrocarbons (PAH) in smoked and grilled foods.]
Heddeghem, A. van; Giel, W. van; Moor, H. de
Mededelingen van de Faculteit Landbouwwetenschappen Rijksuniversiteit Gent 44 (3/4) 1221–1235 (1979) [22 ref. Nl, en]

The chromatographic method of Gertz [see FSTA (1979) 11 4A280], previously used for benzo(a)pyrenes was modified for detn. of PAH; the method involves separation by HPLC and detection by fluorometry. Samples of barbecued smelt, braised meat loaf, smoked bacon, ham and herring and of liquid smoke preparations were analysed; all contained 5 different PAH, some in considerable quantities. It is considered that further research is required into the subject. HBr

22

Drying seafood products with solar energy. (In *'Changing energy use futures'* [see FSTA (1981) 13 3A125].) [Lecture]
Deng, J. C.; Chau, K. V.; Baird, C. D.; Heinis, J. J.; Perez, M.; Wu, L.
pp. 1884–1892 (1979) [14 ref. En] [Dep. of Food Sci. & Human Nutr., Univ. of Florida, Gainesville, Florida 32611, USA]

Studies on solar drying of fishery products, either by direct insolation or by means of solar-heated air, are described, together with investigations on a solar-assisted fish smoker. The equipment used is described in detail. Mullet fillets and roe were used in the drying trials; split brined mullet were used in the smoking trials. Graphs of results are given. In the direct insolation drier, the drying rate was proportional to product temp.; increased air flow rate resulted in cooling of the product and reduced drying rate. Extensive browning was observed, suggesting that lower product temp. are desirable. In the forced-convection drier using solar-heated air, the drying rate was low and mould growth occurred on the product surface. Drier performance was affected by wind and rain. The solar-assisted fish drier proved technically feasible for smoking and cooking of fish. AJDW

23

[Influence of smokehouse technology on phenols in the smoke.] Einfluss der Räuchertechnologie auf die Phenole des Rauches.
Toth, L.
Fleischwirtschaft 60 (8) 1472, 1474, 1476–1477; 1517 (1980) [4 ref. De, en] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

This lecture discusses the phenols found in smokehouse smoke and in smoked meat products, and the influence of the wood and the combustion temp. The concn. of all phenols increases 4-fold with temp. between 450° and 650°C, but little 3,4-benzpyrene is produced at the low smoke generation temp. (300°–400°C) used in the new smoke producers, e.g. condensate and friction smoke generators. Smoke generated by friction (at 380°C) from beech wood contained only low amounts of volatile phenols (phenol, *o*-, *m*- and *p*-cresols), low quantities of guaiacol and syringol, higher % amounts of allyl- and propenyl-syringol, and only about 10% of higher mol. wt.

compounds. In parallel with the changed composition, the sensory quality of meat products treated by friction smoke is changed, with adverse effects on taste and smell. No systematic examination of the relation between the phenol composition of smokehouse smoke and sensory quality of meat products has been done to date. RM

24

Genotoxicity of the food colours Red 2G and Brown FK in bacterial systems.
Haveland-Smith, R. B.; Combes, R. D.
Food and Cosmetics Toxicology 18 (3) 223–228 (1980) [32 ref. En] [Dep. of Biol. Sci., Portsmouth Polytech., Portsmouth, Hants., UK]

The genetic effects of 2 de-listed colours Red 10B and Red 6B, which are structural analogues of Red 2G, were studied. Whilst Red 6B was inactive under all conditions, Red 10B was genotoxic without activation, and this activity was abolished by microsomal activation and/or chemical reduction. Reduction eliminated the indirect activity of Red 2G and did not affect the lack of activity of the dye in the absence of microsomes. Red 2G and Brown FK were subjected to anaerobic in vitro incubation with whole-cell rat caecal extracts. The indirect genotoxicity of Red 2G was reduced after caecal pretreatment. Although the direct activity of Brown FK was reduced, the indirect activity of the dye was either unaffected or slightly enhanced according to the genetic systems used. This means that the food colour Brown FK may be more of a hazard. [See also preceding abstr.] VJG

25

Determination of 3,4-benzopyrene and benzanthracene (PAH) in phenolic smoke concentrates.
Silvester, D. J.
Journal of Food Technology 15 (4) 413–420 (1980) [2 ref. En] [White Stevenson Ltd., Albert Road North, Reigate, RH12 9ER, UK]

An HPLC method is described for detn. of polynuclear aromatic hydrocarbons (PAH), in particular the 2 title compounds, in smoke concentrates used for flavouring foods [including cheese]. Smoke concentrate samples (50 g) are dissolved in 1M NaOH, and extracted twice with hexane. Hexane extracts are washed with water, H_3PO_4 and water again, and cleaned up on an alumina column, before evaporation to dryness, dissolution in acetonitrile and injection of samples in the HPLC system. The column used is Partisil 10 ODS II; samples are eluted with methanol/acetonitrile/water (35:35:30 by vol.), and are quantified by fluorometry (excitation at 280 nm, emission at >390 nm). Limit of detection of 3,4 benzpyrene or benzanthracene is approx. 1 part/10^9. Improvements in sensitivity and selectivity are required for detn. of other PAH. DIH

26

Hot smoking of fish.
Bannermann, A. M.
Torry Advisory Note No. 82, 11pp. (1980) [En]

This note defines the term hot smoking, gives a general description of the process and the equipment used, and gives specific recipes for all hot smoked fish products encountered in the UK industry. Recipes for specific white fish, fatty fish and shellfish products are given in alphabetical order. Advice is also given on the packaging, storage and keeping quality of the finished products. AS

27

Fish smoking: a dictionary.
Waterman, J. J.
Torry Advisory Note No. 83, 10pp. (1980) [En]

Short definitions are provided for about 150 terms used to describe smoked fish products and their preparation. Obsolete and foreign terms have been largely excluded. RM

28

[Preparation of fish for hot-smoking by use of a smoking agent.]
Kurko, V. I.; Goncharov, A. M.; Egorshin, V. V.; Zakharova, L. A.
Rybnoe Khozyaistvo No. 3, 64–65 (1980) [Ru] [VNIRO, USSR]

The smoking preparation 'Vakhtol' for the hot-smoking process is discussed; fish were tested in a centrifuge (type NIO-IDC). It was practicable to pre-dry the fish at 50–60°C for 10–20 min, the moisture-laden air being intensively removed; the smoking should be applied for a period of 70–90 min to reach 80°C body core temp., with subsequent cooling to 40–45°C for 20 min. During smoking the preparation is dispersed in 2 phases; the 1st is added for 10–15 min till 60°C is reached; the 2nd phase is added for 20–30 min, when the preliminary moisture-laden air had been exhausted. STI

29

[Smoking of meat products.]
Talon, R.; Girard, J. P.
Viandes et Produits Carnes 1 (4) 16–22; (5) 18–20 (1980) [47 ref. Fr] [Sta. de Recherches sur la Viande, INRA, Theix-63110 Beaumont, France]

Aspects considered include: the technology of generation of smoke (conventional smouldering, heating with a superheated steam/air mixture, a fluidized bed process, a 2-stage process, and smoke generation by friction); characteristics of smoke produced by various methods; smoking methods and equipment; liquid smoke preparations; the relative merits of various woods for smoke generation; flavour, texture, colour and keeping quality of smoked products antioxidant action of smoke constituents; bacteriostatic/bactericidal action; contamination of smoked foods with polycyclic aromatic hydrocarbons; and reaction of smoke constituents with amino acids, with consequent adverse effects on nutritional value. AJDW

30

[Content of phenolic and carbonyl compounds in cold smoked products.]
Khlamova, R. I.; Solov'eva, L. I.; Petrakova, A. N.
Myasnaya Industriya SSSR No. 2, 37–38 (1980) [6 ref. Ru] [Vses. Nauchno-issled. Inst. Myasnoi Promyshlennosti, USSR]

Comparisons were made of total phenolic and carbonyl compounds contents in products not processed by heat and made by traditional smoking or using a smoke liquid. The processing method does not substantially affect the levels of phenolic and carbonyl compounds in the muscle of meat not processed by heat. Phenols are higher in fat tissue of products treated in smoke. Smoked products processed by the traditional method contain 2.06 ± 0.21 mg% phenols; in those processed using the smoke liquid the phenols are 1.42 ± 0.22 mg%. STI

31

[Effect of vacuum processing on distribution of NaCl in the raw material.]
Minaev, A. I.; Labetskii, E. V.
Myasnaya Industriya SSSR No. 2, 36–37 (1980) [7 ref. Ru] [Moskovskoe Proizvodstvennoe Ob"edinenie Myasnoi Promyshlennosti, Moscow, USSR]

Feasibility of processing the material for smoked pork under vacuum is discussed; brining and vacuum processing carried out simultaneously accelerate smoked meat manufacture. The meat receives a brine injection and is placed on trucks (200 l vol.) and immersed in brine (1087 kg/m^3 density) containing 0.05% sodium nitrite. The trucks are taken to a specially constructed unit for vacuum treatment; after 30 min treatment under vacuum the meat is kept in the trucks for 4 days at +4°C. The subsequent processing is the same as with ordinary smoked meat processing. The new technology increases the yield of the finished product by 3.4%. STI

32

[Experience with the operation of meat smoking plants of the KUM and AKTUA types.]
Pokorny, P.
Zpravodaj Masneho Prumyslu No. 3, 41–45 (1979) [Cs, ru, en] [Vyzkumny Ustav Masneho Prumyslu, Brno, Czechoslovakia]

At present mainly the KUM box type smoking equipment is used, while the AKTUA tunnel type equipment is used less frequently. The smoking equipment, which is partly equipped with automatic control apparatus, must be operated according to manufacturers' instructions to obtain good results. STI

33

[Manufacture of raw dry sausages.] Herstellung von Rohwurst.
Winter, F. F.
Fleischerei 31 (8) 840, 842; (9) 906, 908 (1980) [1 ref. De]

Manufacture of raw dry sausages is discussed, with reference to: cold smoking; required smoke characteristics; effects of smoking on colour, flavour, and keeping quality of the sausage; adverse effects of rapid cooking after smoking; drying/ripening, with reference to optimization of conditions, and their effect on product quality; and packaging of raw dry sausages for brief or prolonged storage. AJDW

34

Effect of pre-chill processing on keeping quality of smoked hams.
Anjaneyulu, A. S. R.; Gupta, B. S.; Netke, S. P.; Dabadghao, A. K.
Journal of Food Science and Technology, India 17 (3) 150–153 (1980) [11 ref. En] [Dep. Anim. Nutr. & Food Tech., Coll. Vet. Sci. & Anim. Husbandry, Jabalpur, Madhya Pradesh, India]

Smoked hams prepared by (i) pre-chill (not chilled prior to smoking), and (ii) post-chill (chilled for 24 h before smoking) methods with dry curing were stored for 4 days at room temp. and 44 days at refrigerated temp. and organoleptically evaluated. Uncured (i) and (ii) did not significantly differ either in proximate composition or in bacterial load, but the pH of uncured (i) was 6.37 vs. 5.93 for uncured (ii). pH, proximate composition, chloride, nitrite, and free fatty acid (FFA) contents and curing and smoking losses, organoleptic and visual qualities did not differ between (i) and (ii). pH was not correlated with duration of storage at 2–4°C. FFA and bacterial load were significantly positively correlated ($P < 0.01$) with duration of storage at 2–4°C. (i) and (ii) could be stored for up to 4 days at room temp. (approx. 15°C) and for up to 36 days at 2–4°C. CFTRI

35

Benzpyrene in smoked poultry.
Raja, K. C. M.; Mahendrakar, N. S.; Moorjani, M. N.
Journal of Food Science and Technology, India 17 (3) 156 (1980) [5 ref. En] [Cent. Food Tech. Res. Inst., Mysore-570 013, India]

Attempts were made to reduce the benzpyrene content of smoked poultry by controlling the smoking time, and reducing the combustion time by moistening the wood shavings. It was found that restricted air supply for 3–4 h and moistening the wood shavings lowered benzpyrene content to 0.0–0.002 p.p.m., compared to 0.002–0.021 and 0.032–0.063 in 3–4 h and 7–8 h smoking resp. with free air supply and dry wood shavings. CFTRI

36

Contribution to the knowledge of inhibitory effects of potassium sorbate and smoke preparations (producer Etol Celja) on some sorts of moulds isolated from sausages surface. [Lecture]
Todorovic, M.; Oluski, A.; Skrinjar, M.
Proceedings of the European Meeting of Meat Research Workers No. 25, 12.12:937–12.12:943 (1979) [13 ref. En, de, fr, ru] [Fac. of Tech., Univ. of Novi Sad, Yugoslavia]

Investigations were conducted to study the inhibitory effect of various concn. of potassium sorbate (6%, 7%, 8% and 10%) on 8 spp. of moulds *(Mucor christianiensis, M. dimorphosphorus, M. heterosporus, M. sciurinus, M. vosnessenskii, Penicillium concentricum. P. verrucosum* var. *cyclopium* and *P. verrucosum* var. *ochraceus)* isolated from the surface of meat products. Effects of potassium sorbate were also investigated for mixed cultures of these moulds. Czech 'Etol-Celje' smoke preparations added at concn. of 0.5%, 1%, 1.5%, 2%, 6%, 7%, 8% or 10%, had no effect on growth and multiplication of these moulds. [See FSTA (1981) 13 5S668.] STI

37

[Selection of smoke preparations by sensory analysis.] Räucher-Präparate-Auswahl nach den Methoden der sensorischen Analyse. [Lecture]
Dubravicky, J.; Jajcay, J.; Greschnerova, M.
Proceedings of the European Meeting of Meat Research Workers No. 25, 12.4:891-12.4:896 (1979)
[De, en, fr, ru] [Chem.-Tech. Fac., Slovakian Tech. Univ., Bratislava, Czechoslovakia]

Studies were conducted on the suitability and optimum concn. of the Soviet smoking preparations VNIIMP and VNIIMP 1, and the Hungarin preparations Fumosal conc., Fumosal aer and Fumosal S-30 in the manufacture of 3 sausage types (fine salami in Cutisin casing, coarse salami in paper casing and ham salami pasteurized in cans). The products were evaluated by consumer evaluation on the basis of packaging, consistency, aroma, appearance and taste, and by a taste profile method in which various taste components, e.g. 'salt', 'meat', 'curing', 'seasoning' were evaluated on a 6-point scale. The suitability and optimum concn. of the smoking agents varied in products differing in particle size and packaging. [See FSTA (1981) 13 5S668.] STI

38

[Chemical analysis and sensory evaluation of the quality of cooked, smoked and dry sausage.] [Lecture]
Solntseva, G. L.; Sobyanina, A. A.; Khrapunkova, O. V.
Proceedings of the European Meeting of Meat Research Workers No. 25, 5.20:375-5.20:380 (1979)
[4 ref. Ru, en, de, fr] [Vses. Nauchno-issled. Inst. Myasnoi Promyshlennosti, Moscow, USSR]

The chemical composition and sensory characteristics of cooked, smoked and dry sausages were studied. Sausage quality was evaluated on the basis of protein and fat levels; the water:protein, fat:protein and water:fat ratios were determined. Ranges of values for these ratios were 0.87-1.22, 2.21-2.87, and 0.31-0.50, resp. It was shown that a wide variation in the fat content of these sausages had no significant effect upon their consumer acceptability. A study into the interrelation between individual sensory characteristics and the overall quality of dry sausages indicated that the flavour was critical for the overall quality evaluation. [See FSTA (1981) 13 5S668.] STI

39

[Ageing of soft dry sausages prepared with starter culture and liquid smoke preparation.] [Lecture]
Krylova, V. V.; Mikhailova, M. M.; Likhonosova, N. D.; Belova, V. Yu.; Solodovnikova, G. I.
Proceedings of the European Meeting of Meat Research Workers No. 25, 6.19:549-6.19:554 (1979)
[6 ref. Ru, en, de, fr] [Vses. Nauchno-issled. Inst. Myasnoi Promyshlennosti, Moscow, USSR]

Application of liquid smoke preparations in meat products offers hygienic advantages, inhibits oxidation and improves colour. Complete imitation of the flavour of traditionally-smoked sausages has not, however, been achieved. The potential for combined use of liquid smoke and starter cultures is discussed. Use of a liquid smoke and the starter culture BP-SK (containing lactobacilli and micrococci) in manufacture of soft dry sausages was studied. No significant difference in wt. loss or biochemical, physicochemical or microbiological characteristics of sausages made by this method or traditional methods was observed. [See FSTA (1981) 13 5S668.] STI

40

[Optimization of processing conditions for cooking, smoking and drying of sausages.] [Lecture]
Lykova, A. V.; Rogov, I. A.; Vereshchagin, V. G.; Slepykh, G. M.; Oblivina, V. N.
Proceedings of the European Meeting of Meat Research Workers No. 25, 7.16:641-7.16:644 (1979)
[Ru, en, de, fr] [Moskovskii Tekh. Inst. Myasnoi i Molochnoi Promyshlennosti, Moscow, USSR]

Optimum drying, cooking and smoking conditions for sausages were determined by experimental and theoretical methods; kinetics and dynamics of these processes are discussed. It is stated that the drying rate of sausage products does not depend on their packing density in the drying chamber. Analysis of experimental data suggests that it is necessary to decrease phase change (vapour formation) to decrease the temp. and moisture content gradient along the diam. of the sausage. The heating rate of the sausages was max. when they were heated in water. The results are also considered in relation to continuous processing of sausages. [See FSTA (1981) 13 5S668.] STI

41

[The digestibility (in vitro) of the muscle proteins of pork products as affected by processing.] [Lecture]
Kolesnikova, V. T.
Proceedings of the European Meeting of Meat Research Workers No. 25, 5.19:369-5.19:374 (1979)
[10 ref. Ru, en, de, fr] [Vses. Nauchno-issled. Inst. Myasnoi Promyshlennosti, Moscow, USSR]

The digestibility (in vitro) of the muscle proteins of baked, dry smoked and smoked/baked pork loins was studied: smoking was performed conventionally and with a liquid smoke. It was found that the muscle proteins of dry smoked and smoked/baked loins had higher digestibility than baked loins, irrespective of the smoking method. The results indicated that the muscle proteins of dry smoked loins were digested more readily than those of smoked/baked loins. [See FSTA

42

Application of liquid smoke for the production of cooked ham. [Lecture]
Baichev, I.; Stefanov, Y.
Proceedings of the European Meeting of Meat Research Workers No. 25, 12.13:945–12.13:948 (1979) [9 ref. En, de, fr, ru] [Meat Tech. Res. Inst., Sofia, Bulgaria]

To improve the flavour of ham produced by an accelerated process, optimum doses of liuqid smoke were used. Results of comparative physico-chemical and organoleptic analyses of batches of ham prepared with or without the addition of liquid smoke, under the same manufacturing conditions, show a beneficial effect of liquid smoke on cooked ham flavour. The Soviet smoke preparation VNIIMP-I, used at a level of 100 g/100 kg brine considerably improves the organoleptic properties (especially taste and flavour) of cooked ham. [See FSTA (1981) 13 5S668.] STI

43

[Liquid smoke preparations in meat product manufacture.] (In '*Zbornik prednasok zo IV. celostatneho Sympozia o aromatickych latkach v pozivatinach*' [see FSTA (1981) 13 5T214].) [Lecture]
Dubravicky, J.; Jajcay, J.; Greschnerova, M.
pp. 112–119 (1979) [Sk] [Chemickotech. Fak., Slovenska Vysoka Skola Tech., 880 37 Bratislava, Czechoslovakia]

The USSR VNIIMP and VNIIMP 1, and the Hungarian Fumosal conc. (in vegetable oil), Fumosal S-30 (on a cooking salt carrier), and Fumosal aer (aerosol) liquid milk preparations were tested as aroma supplements to (i) fine salami (from a fine homogeneous mix) in cellulosic casings, (ii) Trnava salami (from a coarse homogeneous mix) in dark paper casing, and (iii) ham salami (from a non-homogeneous mix) in cans; traditionally smoked and heat-treated (i) and (ii) and pasteurized (iii) served as controls; evaluation by organoleptic score and sensory profile was carried out by a panel. The results are tabulated in detail. Fumosal S-30 showed generally the best aroma-producing properties; for (i), Fumosal conc. at 10 mg/kg and Fumosal S-30 at 0.2 g/kg proved most suitable, but the casing did not perform well on cooking in water; (ii) gave excellent results with Fumosal S-30 at 0.4 g/kg; and with (iii), VNIIMP and VNIIMP 1 at 0.3% of product wt., or Fumosal S-30 at 0.2 g/kg gave good results. SKK

44

The catalysis of the N-nitrosation of secondary amines by nitrosophenols.
Davies, R.; Massey, R. C.; McWeeny, D. J.
Food Chemistry 6 (2) 115–122 (1980) [11 ref. En] [Min. of Agric., Fisheries & Food, Food Lab., Haldin House, Queen Street, Norwich, UK]

The catalytic effect of nitrosophenols on N-nitrosamine formation was studied, in view of the presence of phenolic compounds in smoked foods. Rate constants and reaction orders were determined for catalysis of the N-nitrosation of pyrrolidine and morpholine by *p*-nitrosophenols and the structurally related *p*-nitroso-N-alkylanilines and *p*-nitroso-N-dialkylanilines. A mechanism is proposed, in which the nitrosophenol reacts via its quinone monoxime tautomer with HNO_2 (or species in equilibrium with HNO_2) to produce an intermediate nitrosating agent which undergoes attack by the amine to produce the N-nitrosamine and regenerate the catalyst. RM

45

[Treatment chamber, in particular smoke chamber.]
Behandlungskammer, insbesondere Räucherkammer.
Maurer, S.
German Federal Republic Patent Application 2 900 012 (1980) [De]

Treatment chamber has apparatus for producing steam and/or smoke and/or for cleaning the chamber. The smoke producing and cleaning apparatus is positioned on the exterior and/or interior of the door, accessible from the outside. W&Co

46

[Intensification of the smoking process, and operation of new continuous tunnel-type smoking chambers.]
Adam, M.; Kubes, P.; Polach, P.; Augustin, J.
Prumysl Potravin 31 (9) 505–508 (1980) [4 ref. Cs, ru, en] [Vyzkumny Ustav Potravinarskeho Prumyslu, Prague, Czechoslovakia]

Modifications and improvements of Aktua tunnel-type smoking chambers manufactured by Vzduchotechnika, n.p., Nove Mesto nad Vahom, Czechoslovakia concerning aerodynamics, sanitary standards, temp. control, heater performance, cleaning system, and fire extinguishing equipment are described and diagrammatically illustrated; increased use of stainless steel was a particular feature. Temp. changes during smoking of frankfurters and salami in the new installation are graphically shown. Technical data include: chamber area 29.5 m^2, heat output 360 kW, heat consumption 955 kJ/kg raw material, and mean smoked product output 1043.5 kg/h. SKK

47

Processed cheese. [Review]
Mann, E. J.
Dairy Industries International 46 (2) 13–14 (1981) [30 ref. En] [Commonwealth Bureau of Dairy Sci. & Tech., Lane End House, Shinfield, Reading RG2 9BB, UK]

After outlining recent developments in the USSR and Scandinavia, the author deals with: the use of enzyme-modified pre-cheese mix in processed cheese manufacture; production of smoked processed cheese; use of fermented retentates, buttermilk concentrates and whey protein isolates in processed cheese manufacture; physical properties and flavour of processed cheese; and standards. FL

48

Toxin production by *Clostridium botulinum* type E in smoked fish in relation to the measured oxidation reduction potential (Eh), packaging method and the associated microflora. (In '*Advances in fish science and*

technology' [see FSTA (1981) 13 6R300].) [Lecture]
Huss, H. H.; Schaeffer, I.; Pedersen, A.; Jepsen, A.
pp. 476–479 (1980) [24 ref. En] [Tech. Lab., Min. of Fisheries, Tech. Univ., Lyngby, Denmark]

3 experiments were conducted on hot-smoked herring. The first involved intramuscular inoculation in the loin with 10^2 *Cl. botulinum* type E spores/g and also, in some cases, with 10^3 of a specific (unnamed) spoilage organism/g. The 2nd experiment involved surface contamination with the specific spoilage organism and/or type E spores, both at levels of 10^3/g, while the 3rd experiment involved surface inoculation with 5×10^1 type E spores/g. The inoculated samples and uninoculated controls were then packaged by one or more of the following methods: vacuum-packed singly in polyamide-laminated bags (Rylothene-S); air-packed in polyethylene bags; and packed in Rylothene-S bags containing different proportions of N_2 (0.29–99.92%), CO_2 (0–99.58%) and O_2 (0.09–99.70%). The packaged samples were stored at 15°C for up to 16 days and examined at intervals for toxin production and for changes in gas composition, Eh and partial pressure of O_2. The Eh levels found (≤ 250 mV) did not inhibit the initiation of growth and toxin production by the spores. Results also indicated that vacuum-packing and/or surface contamination with the spoilage organism enhanced and stabilized toxin production in herring surface contaminated with spores. The safest packaging method with regard to toxin production was found to be packaging in an equal mixture of O_2 and CO_2. The most alarming finding was that herring surface contaminated with 10^2 type E spores/g and packaged either in air or in pure O_2 can become toxic within 6–9 days at 15°C. [See also FSTA (1980) 12 3R177.] JA

49

Inhibition of the trimethylamine oxide degrading enzyme in frozen smoked cod. (In '*Advances in fish science and technology'* [see FSTA (1981) 13 6R300].) [Lecture]
Moini, S.; Storey, R. M.
pp. 279–283 (1980) [14 ref. En] [Torry Res. Sta., Aberdeen, UK]

Samples of inshore cod were filleted, skinned, brined in NaCl solution and minced. The fillet mince was then mixed well, packed into Al foil dishes (160 × 100 × 25 mm) and smoked on one surface only in a kiln at 28°C and 72% RH for 3 h, using a smoke velocity of 1.5 m/s; unsmoked control samples were dried in a wind tunnel under similar conditions of temp. and RH. The dishes of mince were then frozen to −30°C in <2 h, wrapped in Al foil, sealed in polyethylene bags, stored for a short time at −30°C and then for up to 180 days at −4°, −10°, −15° or −30°C. After appropriate periods of storage, the frozen mince was sliced into 3 mm layers and the layers were analysed for formaldehyde and phenols. Results are presented in graphs and tables. Analytical results indicated that formaldehyde concn. in smoked fish was greatest in the bottom layer while phenol concn. was greatest in the top layer. Reasons for this are considered. Diffusion of the phenols through the various layers during frozen storage proceeded at a rate governed by the storage temp. The results are discussed with reference to their relevance to the inhibition of trimethylamine oxide degradation. The results obtained are of limited practical significance, since fish is usually smoked whole or as fillets rather than as mince. JA

50

Recovery of phenols from fish using a solvent extraction technique. (In '*Advances in fish science and technology'* [see FSTA (1981) 13 6R300].) [Lecture]
McGill, A. S.; Murray, J.; Parsons, E.
pp. 283–286 (1980) [17 ref. En] [Torry Res. Sta., Aberdeen, UK]

Examination of the literature revealed that procedures used for recovering phenols from smoked foods are generally unsatisfactory and result in non-quantitative recoveries. This paper reports the development of a more satisfactory procedure which gives good recoveries of phenol and aldehydic phenols. The procedure involves use of a room temp. solvent extraction technique based upon that of Bligh & Dyer [*Canadian Journal of Biochemistry & Physiology* (1959) **37,** 911–917] and was successful in recovering added phenol, vanillin and syringaldehyde from herring flesh; phenol was selected because of its volatility and vanillin and syringaldehyde because of their absorptive nature. The recovery technique is described in detail; preliminary work involved detn. of the distribution of the 3 phenols between the chloroform and methanol/water phases and detn. of the recovery of radioactive phenol from fish protein. The solvent extraction technique was used for the limited analysis of phenols in a range of smoked fish spp.; results indicated that the technique is appropriate for the phenol concn. occurring in such fish and resulted in near quantitative phenol recovery. JA

51

The development of analytical methods for investigating chemical changes during fish smoking. (In '*Advances in fish science and technology'* [see FSTA (1981) 13 6R300].) [Lecture]
Clifford, M. N.; Tang, S. L.; Eyo, A. A.
pp. 286–290 (1980) [22 ref. En] [Dep. of Biochem., Univ. of Surrey, Guildford, Surrey, UK]

Relatively little information is available on the chemical composition and nutritive value of smoked fish. This paper reports 2 studies which attempted to obtain such information. The first involved monitoring of lysine and total basic amino acid residues in smoked and unsmoked coley (*Pollachius virens*) fillets by dye-binding, utilizing the dye-binding difference method of Sandler & Warren [FSTA (1975) 7 2A107] with methyl chloroformate being used as the lysine-blocking agent. Results indicated that the lysine content fell progressively during a 5 h smoking period to approx. 75 and 89% of the original level in the surface and middle layers of the fillets, resp. The 2nd study used a metaperiodate reagent to monitor the phenol content of hot-smoked coley fillets and of various synthetic mixtures of smoke phenols (guaiacol, phenol, eugenol, syringol). Previous studies [FSTA (1976) 8 10H1821] had indicated that metaperiodate is well suited to the routine quantitative detn. of chlorogenic acids and this study confirmed that metaperiodate has considerable promise as a means of monitoring smoke phenols but it is recommended that it be used in conjunction with other functional group specific reagents. JA

52

The utilization of Mediterranean sardines by means of smoking. (In '*Advances in fish science and technology*' [see FSTA (1981) 13 6R300].) [Lecture]
Senesi, E.; Bertolo, G.; Torreggiani, D.; Cesare, L. di; Caserio, G.
pp. 290–293 (1980) [7 ref. En] [Istituto Sperimentale per la Valorizzazione Tecnologica dei Prodotti Agricoli, Milan, Italy]

With the aim of improving the utilization of the Italian sardine catch, attempts are being made to find new processing methods; processing is currently limited to canning in oil. This paper reports studies which examined the smoking of sardine fillets and subsequent preservation by cold storage or canning. Fillets intended for cold storage were subjected to the following treatments: dipping in 26% (w/w) NaCl brine for 5 min at 20°C, draining, holding at 0°C for 24 h, cold-smoking at 30°C for 75 min, hot-smoking (to achieve pasteurization) at 82°C for 30 min, vacuum-packing in plastics film of low O_2 permeability, and storage for 6 months at −20°C or 0–2°C. Fillets for canning were treated as follows: dipping in brine containing 10, 12 or 15% NaCl for 5 min, holding briefly at 0°C to allow drainage, smoking in dense smoke at 30°C for 60 min, cooking with steam for 1 min (to achieve an internal muscle temp. of 70°C), drying in the presence of smoke, canning in olive oil in coated Al cans (105 × 76 × 21 mm), heating of cans at 102°C for 30 min followed by rapid cooling. The frozen, refrigerated and canned fillets were subjected to organoleptic evaluation, colorimetric analysis, analysis for NaCl and phenol, and bacteriological examination. Results are tabulated and indicated that smoking is a feasible process when combined with cold storage or canning, e.g. smoked fillets stored in vacuum-packs at 0–2°C had a shelf-life of 4 months. The canned fillets were commercially stable but not necessarily sterile. JA

53

Development of matured krill sausage. (In '*Advances in fish science and technology*' [see FSTA (1981) 13 6R300].) [Lecture]
Christians, O.
pp. 322–324 (1980) [En] [Bundesforschungsanstalt für Fischerei, Inst. für Biochem. & Tech., Hamburg, Federal Republic of Germany]

Preliminary studies indicated that the liquefying effect of proteases in raw minced krill meat renders it unsuitable for sausage manufacture. Further studies therefore utilized cooked meat in which the proteases had been inactivated by the cooking process. Since the cooked meat contains little soluble protein, it must be supplied by another source (e.g. fresh fish). The studies reported in this paper examined the effect of various factors on the maturation ($\leq$20 days) of sausages prepared from a mixture of minced cooked krill meat (52.0%), unsmoked bacon (26.4%), minced fresh fish (20.3%), salt (1.0%) and spices (0.3%). The course of maturation was followed by measuring the pH and contents of volatile bases, lactic acid and acetic acid. Factors examined included: addition of glucose (0.5–8.0%), lactose (2–8%), organic acid (0.5–1.0%), glucono-δ-lactone (0.5–1.0%) and starters (lactobacilli, pediococci and a mixture of lactobacilli and micrococci) and type of smoking procedure (no smoking, hot smoking and 3 cold smoking methods). Results are presented in graphs. Conclusions included the following: addition of sugar is necessary to cause acidification; studies of smoking methods indicated that a sufficiently low pH can be reached only with cold smoking; addition of organic acids and glucono-δ-lactone reduces the initial pH of the sausages; sausage flavour is influenced by the smoking procedure and the starter; starters have a favourable influence on maturation. JA

54

Studies on the uptake and distribution of curing ingredients in the cured and smoked poultry meat.
Raja, K. C. M.; Puttarajappa, P.; Khabade, V. S.; Mahendrakar, N. S.; Mahadevaswamy, M.; Moorjani, M. N.
Indian Journal of Poultry Science 15 (2) 63–67 (1980) [8 ref. En] [Div. of Meat Fish & Poultry Tech., Cent. Food Tech. Res. Inst., Mysore-570 013, India]

Dressed poultry was cured at 2–3°C for 24 h by immersion in curing brine containing NaCl (5 kg), sugar (3.12 kg), $NaNO_2$ (92 g) and water (28 l), with a salinometer reading of 65°. The cured poultry was then smoked for 3–4 h using wood shavings, cooled to 25–28°C and analysed. The NaCl and nitrite concn. immediately after curing and smoking are higher in the surface layers than in the interior of the product; however, this difference is eliminated during storage. When poultry is cured with a brine containing $NaNO_2$ alone, the initial nitrite concn. appears to be sufficient to compensate for the depletion occurring during storage. No microbial spoilage was observed in cured poultry products during storage for 7 days at 25–28°C. CFTRI

55

[Trends in meat smoking technology.]
Quaglia, G. B.
Industrie Alimentari 19 (11) 833–835 (1980) [It]

In this general survey, aspects discussed include the importance of such quality factors as pretreatment (e.g. salting), source and circulation of smoke, moisture content, time and temp. of drying, antimicrobial action of approx. 200 chemical constituents of woodsmoke and their antioxidant properties, mechanism of colour formation in smoked products of 6–10% moisture content, and characteristic aroma attributable to phenolic compounds. Latest technology substitutes liquid extracts of smoke for the traditional process; it is quicker, cheaper, removes tarry or sooty odours, and obviates development of 2 groups of possibly carcinogenic compounds (polycyclic aromatic hydrocarbons and nitrosamines) on product surface. Production line adaptations of the extracts for (i) bacon, meat and chicken, and (ii) fish, are detailed, giving wt. loss ((i) 0.9–1.0%, (ii) 5–7% (with hot air in conditioning tunnel) or 0–2% (with cold air), vs. 6.5–7.5% and 12–

15% for (i) and (ii) resp., using traditional methods). This technology also employs vacuum techniques, the cold chain, and electrostatic precipitation (e.g. Volstatic equipment) of mixtures of smoke extracts. Salting and smoking can be performed in one operation. It is also applicable for potato products. KME

56

[The effect of autolytic changes of meat and technological additives on the available lysine, methionine and cysteine contents in canned meat products.] Einfluss autolytischer Veränderungen im Fleisch und der bei der Herstellung von Fleischkonserven verwendeten technologischen Zutaten auf den Gehalt an „available“ Lysin, Methionin und Cystein.
Janitz, W.
Fleischwirtschaft 60 (11) 2063–2066 (1980) [18 ref. De, en] [Inst. for Food Res., Agric. Univ., Mazowiecka 48, 60-623 Poznan, Poland]

24 different kinds of canned meat products, prepared with fresh meat, meat with advanced autolytic changes, and thawed frozen meat, as well as with curing salt with phosphates (2.5 g NaCl + 11 mg $NaNO_2$, followed by 0.4 g polyphosphate/100 g meat), fat, a cold smoke preparation and potato starch were examined for changes in available lysine, methionine and cysteine. Results showed that changes in available methionine and cysteine were dependent mainly on the degree of autolytic changes in the meat. Adding phosphates during curing increased losses of available lysine and methionine during sterilization. Losses of available cysteine in canned products made from meat with advanced autolysis were increased by adding a cold smoke preparation, and reduced by fat or starch. AS

57

[Recent figures for benzo[*a*]pyrene contents in meat products.] Neuere Ergebnisse über den Benzo-a-pyrengehalt von Fleischerzeugnissen.
Potthast, K.
Fleischwirtschaft 60 (11) 1941–1942, 1945–1949; 2032–2035 (1980) [22 ref. De, En] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

622 samples of German meat products were examined for benzpyrene contents. Tabulated results showed that 21.1% contained > 1 part/billion (p.p.b.). Most of these were products smoked until black (e.g. 30% of all dark-smoked raw hams, 40% of dark-smoked cooked hams, vs. 10% of light smoked raw hams, 30% of light-smoked cooked hams). The max. content found was 56 p.p.b. As the benzpyrene content usually rises with the sootiness, smokehouse smoke should be as free from soot as possible. Smoke production temp. should be < 700°C to reduce soot and maintain a favourable ratio of desirable (aromatic) to undesirable (carcinogenic) smoke constituents. These temp. can be ensured by using friction or condensate methods of smoke production, or wood smoke with high moisture content and low air supply. Meat products processed in friction and condensate smoke generally contain < 1 p.p.b. benzpyrene. The smoking-room temp. had very little effect on benzpyrene contamination. The tenderness and aroma of hams were better when smoked at 40°C than when cold (20°C) or hot (55°C) smoked. RM

58

[Rationalizing the inspection of meat and meat products. Simple method for routine determination of fat content.] Zur Rationalisierung der Untersuchung von Fleisch und Fleischwaren. Einfache Methode zur serienmässigen Bestimmung des Fettgehaltes.
Künzler, W.; Hauser, E.
Fleischwirtschaft 60 (9) 1680–1681; 1699 (1980) [12 ref. De, en] [Bundesamt für Veterinärwesen, Viktoriastrasse 85, CH-3000 Bern, Switzerland]

The instrument (FETTEX 80) developed for simple serial detn. of fat in meat and meat products reported earlier [FSTA (1980) 12 7S1121] is described. Tabulated data from 25 samples showed that results agreed well with those from the Grossfeld, Rudischer and Soxhlet methods. Mean fat contents determined for 12 replicates of a sample of Cervelas sausage gave fat contents of 24.3–25.7%, s.d 0.384; for 12 samples of smoked bacon, 26.0–27.1%, s.d. 0.339; and for 10 samples of salami 43.1–44.8%, s.d. 0.646. The instrument can also be used for serial fat detn. in other foods and for other liquid-liquid extractions (e.g. residues). The petroleum ether used for extraction can be recovered. Up to 36 extractions/day can be carried out. No specially trained personnel is required. The instrument is available from Mesil AG, Hauptstrasse 15, CH-4528 Zuchwil, Switzerland. RM

59

[Evaluation of Kasseler Rippenspeer (uncooked Kasseler).] Zur Beurteilung von Kasseler Rippenspeer (Rohkasseler).
Krämer, R.; Wegener, J.; Gerigk, K.; Grossklaus, D.
Fleischwirtschaft 60 (6) 1172–1174, 1176–1178; 1221 (1980) [many ref. De, en] [Inst. für Vet. Med. (Robert-von-Ostertag-Inst.) des Bundesgesundheitsamtes, Thielallee 88–92, D-1000 Berlin 33]

To provide information for evaluating Kasseler Rippenspeer (cured hot-smoked pork rib cut), samples of uncooked pork ribs and cured uncooked Kasseler pork ribs, ready for sale, from the current production of a meat processing plant were analysed. Tabulated results showed considerable variations between batches in water uptake during curing (0–14%, mean 5.5%). All the samples from 40 Kasseler spare ribs (11th vertebra) contained extraneous water (max. 15.5%), vs. only 2 of 40 Kasseler loin ribs (26th vertebra, max. 2.5%). Comparison with published values suggests a need for more comprehensive and discriminating evaluation on the basis of spare ribs, anterior and posterior loin ribs, with the following suggested values resp: max. moisture:protein ratio 4.5, 4.2 and 4.2; min. protein in fat-free portion 17, 18 and 19%, max. extraneous water 8, 4 and 0% resp.; max. fat content 18% for all 3 cuts. The number of samples and time of sampling should also be fixed. [From En summ.] RM

60

[Temperature measurement and control in heat-treatment of meat products.]
Marecek, S.
Prumysl Potravin 31 (1) 23–25 (1980) [Cs, ru, en] [Vyzkumny Ustav Masneho Prumyslu, Brno, Czechoslovakia]

The Zeparex time recorders and the Zepakord dot recorders developed by the Nova Paka factory of ZPA (Czechoslovakia) for temp. recording in meat industry processes (smoking, pasteurization, sterilization); the TRS 12 transistorized regulators for control circuits with control sono valves; Zepax indicators; and Zepafat controls and TM10 long-delay time relays are described, and recommendations on layout and application are presented. SKK

61

Determination of polynuclear aromatic hydrocarbons in food, water and smoke using high-performance liquid chromatography.
Crosby, N. T.; Hunt, D. C.; Philp, L. A.; Indu Patel
Analyst 106 (1259) 135–145 (1981) [19 ref. En] [Lab. of the Gov. Chem., Dep. of Ind., Cornwall House, Stamford Street, London SE1 9NQ, UK]

A method for separation of 17 different polynuclear aromatic hydrocarbons (PAH) was developed. After separation by TLC, the PAH are examined by HPLC using ODS (octadecylsilane) and PPS (phthalimidopropylsilane) stationary phases. The elution times of all 17 compounds relative to benzo[*a*]pyrene were computed. 6 representative PAHs (fluoranthene, benzo[*k*]fluoranthene, benzo[*b*]fluoranthene, benzo[*a*]pyrene, indeno[1,2,3-*cd*]pyrene and benzo[*g, h, i*]perylene) were added to bierwurst and water to check recovery values (70–110% recovery from bierwurst). A table shows the levels of these 6 compounds found in bacon, kippers and cheese. The method of extraction and clean-up varies with the substrate (food, water, smoke) but the method of detn. of PAH in the final extract is the same in all 3 cases. Confirmation of identity is by measuring the peak-height ratios for each PAH at 2 different excitation and emission wavelength combinations. The limit of detection of benzo[*a*]pyrene is 0.02 µg/kg in food, 0.3 ng/l in water and 150 pg/filter in smoke. Recoveries of the 6 compounds are generally 75–100% at levels approaching the limit of detection. AL

62

Outdoor Bar-B-Q smoker and grill.
Jansen, R. A.
United States Patent 4 233 890 (1980) [En]

63

Apparatus for smoking foods and smoke producing material therefor.
Perrine, P. M.; Cassera, J. A.
United States Patent 4 232 597 (1980) [En]

Energy and fuel efficient portable smoker is described for quickly imparting a smoked flavour to comestibles. The apparatus includes an airtight enclosure which prevents escape of smoke pyrolysed from a small quantity of smolderable material contained in a removable low power electrically heated smoker unit housing attached to the smoker enclosure. A thermostat controls heating time to rapidly smoke comestibles with minimal temp. rise within the enclosure. The removable smoker unit may be used separately from the enclosure to smoke comestibles in any type of conventional cooking or dehydrating appliance or enclosure. AS

64

[Process for the operation of gas treatment plant suitable for food and plant suitable for carrying out this process.] Verfahren zum Betrieb einer für Lebensmittel geeigneten Gasbehandlungsanlage und zur Durchführung dieses Verfahres geeignete Anlage.
Seydelmann, L.
German Federal Republic Patent Application 2 908 649 (1980) [De]

Process is described for the operation of a gas treatment plant for food equipped with a Muffel burner, especially a heat-smoker-cooking plant, in which food products are treated with gases in a chamber. Gases are passed through the chamber and some or all of the exit gas is then mixed with the muffel burning gases and recycled. W&Co

65

Fish smoking. A Torry kiln operator's handbook. [Booklet]
Burgess, G. H. O.; Bannerman, A. M.
44pp. (1979) [En] Edinburgh, UK; HM Stationery Office [Torry Res. Sta., Aberdeen, UK]

This is the 6th impression of a handbook first published in 1963. It includes chapters on general principles, construction of the kiln, testing the kiln, operating the kiln, some smoked products and more general matters (brining, making a standard product, and cooling, including freezing). RM

66

[Smoke and its preserving role in meat and meat product smoking.]
Butanski, I.
Khranitelna Promishlenost 28 (5) 8 (1979) [Bg]

Smoke quality, suitable wood types, air regulation, and smoking procedures (cold, warm, hot and wet) are considered, together with their effect on the composition and stability of meat products. SKK

67

Processing factors affecting yields and meat quality of smoked bobwhite quail.
Arafa, A. S.; Janky, D. M.; Wilson, H. R.; Oblinger, J. L.; Koburger, J. A.
Poultry Science 58 (6) 1498–1503 (1979) [15 ref. En] [Florida Agric. Exp. Sta., Univ. of Florida, Gainesville, Florida 32611, USA]

Bobwhite quail (equal numbers of males and females) were processed at 16 wk of age in each of 2 trials to study the effect of different chilling times, water agitation, and chill water concn. on cooling rate, thaw loss after frozen storage, yields, and quality characteristics of smoked Bobwhite quail meat. NaCl solutions of 0, 5, and 10% were used for chilling carcasses either without agitation for 16 h or with agitation for 3 h. Brine chilling with or without agitation resulted in faster cooling rate when compared with control (0% NaCl). Non-agitated chilling of carcasses in 5% NaCl solution resulted in significantly ($P < 0.05$) higher ready-to-cook yield, less thaw loss, higher cook yield, more tender meat and better organoleptic characteristics as compared with the control. No advantages in yield or quality were obtained by increasing the non-agitated chilling time from 8 to 16 h. Agitated brine-chilling in 10% NaCl solution resulted in either partial or complete freezing of carcasses during chilling. Meat from carcasses chilled in 10% NaCl was too salty. Regardless of chilling technique, tissue NaCl concn. increased with increasing chill time and brine concn. AS

68

Turkey ham properties on processing and cured color formation

Acton, J. C.; Dick, R. L.; Torrence, A. K.

Poultry Science 58 (4) 843-847 (1979) [36 ref. En] [Dep. of Food Sci., S. Carolina Agric. Exp. Sta., Clemson Univ., Clemson, S. Carolina 29631, USA]

Turkey hams were prepared from boneless thigh meat and evaluated for yields, texture and colour development when processed in the smokehouse to internal temp. from 37.8°C to 71.1°C. Meat yields at various smokehouse temp. significantly ($P < 0.05$) decreased from 96.5% at 37.8°C to 87.3% at 71.1°C. Shear values also significantly ($P < 0.05$) decreased as the product temp. increased, indicating tenderness development. Microwave reheating/cooking of hams removed from the smokehouse at 48.9°, 60.0°, and 71.1°C gave final yields of approx. 85%, irrespective of previous smokehouse cooking temp. Taste panelists scored the ham at 7.2 on a 9-point preference scale for microwave reheated, cooked hams; these scores were not affected by previous smokehouse temp. Haem pigment conversion to the nitric oxide form showed a dependence on the internal temp. of the product during heating, typical of cured meat products. The Gardner a/b ratio showed the largest zone of colour development between 43°C and 49°C. Gardner +a values (for redness) were significantly ($P < 0.05$) correlated with the level of nitric oxide haem pigment produced on heating the turkey hams. AS

69

[Turkey meat and meat products.] Putenfleisch und Putenfleischerzeugnisse.

Müller, -.

Fleischwirtschaft 60 (12) 2129 (1980) [1 ref. De] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

In answer to a reader's question, the author quotes a procedure for producing smoked turkey [from *Feinkostwirtschaft* (1967) 4, 389-391] for hot or cold consumption, and recipes for meat products made with turkey (Brühwurst, Kochwurst). RM

70

Malonaldehyde concentrations in food are affected by cooking conditions.

Newburg, D. S.; Concon, J. M.

Journal of Food Science 45 (6) 1681-1683, 1687 (1980) [17 ref. En] [Dep. of Nutr. & Food Sci., Univ. of Kentucky, Lexington, Kentucky 40506, USA]

The relationship between cooking methods and production of malonaldehyde (MA), a putative carcinogen in mice was studied. In hamburgers pan-fried at moderate temp., the MA content increased 41-55%; frying at higher temp. (shorter cooking times) produced smaller increases. Microwave cooking increased MA concn. by only 15%. In contrast, cooking chicken by microwave, conventional oven, deep-fat-frying, and boiling increased MA concn. by 60-, 55-, 17-19-, and 22-fold resp.; the broth contained half the MA produced in boiled chicken. On an equal portion basis, fried chicken contained less MA than hamburger. Appreciable amounts of MA were also found in smoked trout (2.2-3.8 μg/g), canned chicken broth (2.3 μg/g), bouillon cubes (5.3 μg/g) and cheese (0.44-0.74 μg/g), depending on cooking conditions. IFT

71

Can smoking preserve the mackerel market?

Anon.

Food, Flavourings, Ingredients, Packaging and Processing 1 (11) 38-39 (1980) [En]

A description is given of the production of smoked fish at Ross Foods Ltd new factory in Hull. A variety of smoked fish products are produced for the retail and catering trades. The factory has 2 separate lines, one for hot smoking (mackerel) and the other for cold smoking (kippers and haddock). The market for smoked fish is growing at about 2-3%/yr with approx. 22-25 000 t of smoked fish products being consumed. Ross Foods estimate that they will have about 15% of the mackerel catering market. VJG

72

[Infection of humans by the nematode *Anisakis simplex* in herrings.]

Lagoin, Y.

Bulletin de l'Academie Veterinaire de France 53 (1) 139-146 (1980) [9 ref. Fr, en] [44, Boulevard de Grenelle - 75732, Cedex 15, Paris, France]

Because of recent isolation of *Anisakis simplex* from smoked herrings obtained from a French wholesale market, this review-style article discusses the life-cycle of the organism, and aspects of the human disease, i.e. epidemiology, infection, symptoms and lesions, diagnosis and treatment. A further section discusses measures necessary to prevent occurrence of the disease; freezing herring at ≤ -20°C for 24 h up to 12 h after landing the catch suffices to inactivate the larvae. It is recommended that all fish processed industrially should receive this treatment. In the case of fresh fish sold direct to consumers, it is noted that even mild cooking procedures kill the larvae. DIH

73

Product quality and energy use in high temperature smoking of fish.

Kosak, P.; Toledo, R.

Journal of Food Science 45 (6) 1481–1486 (1980) [8 ref. En] [Dep. of Food Sci., Univ. of Georgia, Athens, Georgia 30602, USA]

A process for heating smoked fish was developed such that the lethality of the heating process is equivalent to a 12 decimal reduction of spores of *Clostridium botulinum* Type E. This lethality is similar to the specifications in the Food & Drug Administratio smoked fish Good Manufacturing Practise regulations. The requirements for a fish smoking oven that would b necessary to carry out the process were also determined. The staged temp. process, which started at 160°F (71.1°C) dry bulb and 140°F (60°C) wet bulb, with wet and dry bulb temp. increases of 10°F (5.6°C) in 10 min increments until the internal temp. of the fish [mullet, mackerel, croaker] reached 194°F (90°C), minimized undesirable defects in the smoked fish product when compared with other smoking (process) schedules. The energy consumption of the recirculating air oven, for the high temp. staged process (186.482 MJ) was found to be twice that for a constant temp. 71.1°C process (92.337 MJ), with most of the energy used attributed to the generation of steam used for humidification, and heat losses through the uninsulated ductwork. A heat balance on an oven with steam humidification and a heating element capacity of 35.5 kW showed that only 45.5 kg product can be processed effectively using the staged temp. process. IFT

74

[Storage stability of Guelders smoked sausage (Gelderse rookworst) containing 20% mechanically deboned pork.]

Hazelkamp, G. P. L. van den; Houben, J. H.; Krol, B.

Tijdschrift voor Diergeneeskunde 105 (21) 900–911 (1980) [19 ref. Nl, en] [Fac. der Diergeneeskunde, Biltstraat 172, 3572 BP Utrecht, Netherlands]

"Gelderse rookworst" (Guelders smoked sausage) was prepared with 20% mechanically deboned pork; controls were prepared with 20% manually deboned meat from the same lot of bones. Products were stored at 12°C for 0, 4 and 8 wk and subjected to chemical analysis (fat oxidation) and sensory evaluation. Meat was obtained from ham bones and vertebrae, fresh or stored for 6 wk at −18°C. The effect of sodium ascorbate or a blend of ascorbyl palmitate and α-tocopherol on oxidative rancidity was studied in the products. The internal and external colour of freshly prepared sausages containing separator meat was superior, the taste inferior to that of the controls. Products with residual meat from vertebrae were better than those with meat from ham bones. Frozen storage of bones had no effect on sensory quality of the products. Peroxide numbers and *p*-anisidine values did not increase significantly during storage of the products. Increasing numbers of samples showed sensory deterioration after 4 and 8 wk storage, especially products prepared with separator meat from frozen bones. Sausages containing ascorbate generally received higher scores for taste and internal colour than products made without ascorbate, or with a mixture of antioxidants. [From En summ.] RM

75

[Bacteriostatic activity of 'Refined Liquid Smoke'.]

Stankiewicz-Berger, H.; Kitzman, P.

Acta Alimentaria Polonica 5 (4) 391–398 (1979) [6 ref. En, pl] [Inst. of Meat & Fat Ind., Warsaw, Poland]

'Refined Liquid Smoke' contains a phenolic fraction (24.3% phenol and homologues, 29.5% guaiacol, and 37% syringol), an acidic fraction (30% acetic acid and homologues, 25% cyclotene and homologues, and 40% phenols), and a neutral fraction (30% ketones and other oxy-compounds, and 30% hydrocarbons). Bacteriostatic activity of this preparation, measured against *Escherichia coli, Clostridium sporogenes* and *Streptococcus faecalis*, did not affect the bacterial growth at concn. <200 p.p.m. It was concluded that the 'Refined Liquid Smoke' preparation cannot improve the shelf-life of meat products when used in organoleptically acceptable quantities (<20 p.p.m.). ESK

76

Pathogenic yeast-like fungi in meat products.

Staib, F.; Mishra, S. K.; Tompak, B.; Grosse, G.; Abel, T.; Blisse, A.; Folkens, U.; Fröhlich, B.

Zentralblatt für Bakteriologie, 1A 248 (3) 422–429 (1980) [27 ref. En, de] [Robert Koch Inst. Fed. Health Office, Berlin]

Presence of yeast-like fungi pathogenic to man in sausages and other meat products was investigated in slices of 100 meat products; inoculated slices were also studied to investigate suitability of such products as growth media for fungi. Slices of sausages or ham from 5 retail butchers were incubated with 1 ml water on Petri dishes and examined for surface colonies after 2 days at 26°C. Of the 100 samples, 14 yielded *Candida parapsilosis* and 1 *C. tropicalis*. No other human pathogen was found; other non-pathogenic fungi were isolated (*Debaryomyces, Saccharomyces*, etc.) but no details of these are reported. Of 11 of the strains of *C. parapsilosis* isolated, 6 were positive for extracellular proteolysis on serum albumin agar. This compared with 27 positive of 27 clinical isolates. 8 of the 11 isolates of *C. parapsilosis* from meat products (including the 6 proteolysing strains) were antigenically related to serotype B of *C. albicans*. 3 selected meat products were inoculated with 1 of 3 *Candida* spp. or *Cryptococcus neoformans*. *C. albicans* showed sparse pseudomycelial growth on (i) Bologna, (ii) salami and (iii) smoked ham. *C. tropicalis* grew well on (ii) but only sparsely on (i) and (iii), pseudomycelium being formed in all cases. *C. parapsilosis* showed strong colony formation on all 3 products, with no pseudomycelium. *Crypt. neoformans* showed moderate formation of round blastospores on all 3 products. Significance of occurrence of pathogenic fungi in sausages is discussed, and closer cooperation between food microbiologists and medical mycologists is suggested. DIH

77

The effect of sex, breed and initial carcass pH on the quality of cure in bacon.
Warriss, P. D.; Akers, J. M.
Journal of Food Technology 15 (6) 629–636 (1980)
[19 ref. En] [ARC Meat Res. Inst., Langford, Bristol, BS18 7DY, UK]

Effect of sex, breed and initial carcass pH (pH_{45}) on quality of visual appearance of smoked Wiltshire style bacon was studied by processing 110 carcasses (42 hogs, 68 gilts) of 3 breed types, and visually assessing quality of cure in *longissimus dorsi*. There were no significant differences between hogs and gilts for muscle pH or cure score, and results were combined. Large White pigs had significantly higher pH_{45} than Landrace or Welsh pigs, but there were no significant differences between breeds for cure score; a non-significant improvement in cure score with decreasing mean pH_{45} was observed between breeds. Cure scores ranged from 1 (poor) to 5 (excellent); discounting the group rated 1 (2 carcasses), the mean pH_{45} for each cure score group decreased with increasing cure score. This was a significant negative correlation ($P < 0.01$). Of the 2 carcasses rated 1, 1 was dark, firm and dry (pH_{45} 6.50) and 1 was pale, soft and exudative (PSE, pH_{45} 5.50). No trend was apparent in pH values 20 h postmortem, and there was no correlation between these values and cure score. Carcasses with $pH_{45} < 6.0$ were classed as PSE, and cure scores of this group were significantly higher ($P < 0.05$) than those of the 'normal' group ($pH_{45} \geq 6.0$; results for the 2 carcasses with a cure score of 1 excluded). DIH

78

[Detection of liquid smoke preparations in sausages.]
Der Nachweis von Raucharoma-Kondensaten in Wurst.
Baltes, W.; Wilcopolski, K.; Lehmann, B.
Lebensmittelchemie und Gerichtliche Chemie 33 (4) 73–74 (1979) [3 ref. De] [Inst. für Lebensmittelchem., Tech. Univ. Berlin, Müller-Breslau-Strasse 10, 1000 Berlin 12]

A procedure for detection of the use of liquid smoke preparations in sausages is described, based on testing for the indicator substance guaiacol in the centre of the sausage, rather than at or near the surface as with conventional smoking; guaiacol is determined by GLC in superheated steam distillates of the samples under test. 8 samples of Jagdwurst and 10 samples of raw ripened sausage were tested by this method. Guaiacol concn. in the Jagdwurst samples ranged from 0.1 to 0.4 p.p.m., probably due to use of smoked backfat; there is no reason to suspect use of liquid smoke in these sausages. Guaiacol concn. in raw ripened sausages ranged from 0.5 to 3.5 p.p.m.; this suggests that many of these sausages were made with liquid smoke. AJDW

79

High velocity smokehouse operation. (In *'Proceedings: Meat processing conference'*.) [Lecture]
Petsel, M.
p. 10 + 11pp. suppl. (1979) [En] [Koch Supplies, Kansas City, Missouri 64108, USA]

Speed of smokehouse operation can be influenced by 3 factors at the product surface, viz. air velocity, temp. and RH. Higher air velocity requires more control over temp. and RH (conditions are less critical with some products than with others). A smokehouse ideally is seen as all-electric (economics of electricity vs. gas are discussed in detail) and well sealed, such that control of humidity is by water driven off the actual product. [See preceding and following abstr.] LH

80

[Methods for purification of smoke from resins.]
Kurko, V. I.; Makarova, N. A.; Gergel', B. E.
Rybnoe Khozyaistvo No. 7, 66–69 (1980) [Ru]
[TsPKTB VRPO "Azcherryba", USSR]

Water-inert equipment for purification of curing smoke is described. The stream of smoke fed by a central tube is reflected against the water level and passed to a side tube and reflected again against the water level. During this process all solid particles pass into the water. The method proved to have a favourable effect on the smoke without reducing its antioxidation properties. Detailed chemical composition of curing smoke prior to and following the purification process are given. STI

81

[Boiled smoked horsemeat sausages. General requirements.]
Hungary, Magyar Szabványügyi Hivatal
Hungarian Standard MSZ 5858-79, 6pp. (1979) [Hu]

82

A contribution to the determination of polycyclic aromatic hydrocarbons in smoked foodstuffs via caffeine complexes.
Sagredos, A. N.; Sinha-Roy, D.; Jan, E. von
Deutsche Lebensmittel-Rundschau 77 (1) 33–36 (1981) [14 ref. En, de, fr] [Unilever Forschungsgesellschaft mbH, D-2000 Hamburg, Federal Republic of Germany]

A procedure for detn. of polycyclic aromatic hydrocarbons (PAH) in smoked foods is described. The sample is finely comminuted, and saponified with methanolic KOH; PAH are extracted with cyclohexane, and isolated by complexing with caffeine/formic acid. The complex is then decomposed with 2% NaCl solution, and PAH are re-extracted into cyclohexane. The extract is dried on anhydrous Na_2SO_4, filtered, concentrated to 2–3 ml, cleaned-up by silica gel column chromatography, and PAH are separated by TLC on alumina (development with isooctane). PAH spots, identified by reference to standards, are scraped off the chromatogram, and determined by UV spectroscopy or fluorimetry. Recovery from fish and meat ranged from 74% (1,12-benzoperylene) to 99% (phenanthrene). Detection limit was approx. 0.2 μg/kg with UV spectroscopy, 0.02 μg/kg with fluorimetry. Data are given for concn. of 13 PAH in skin and meat of smoked mackerel and herring. Good separation of PAH was achieved. AJDW

83

Smoked food and cancer. [Lecture]
Fritz, W.; Soos, K.
Bibliotheca 'Nutritio et Dieta' No. 29, 57–64 (1980) [15 ref. En] [Zentralinst. für Ernährung, Akad. d. Wissenschaften, Potsdam-Rehbrücke, German Democratic Republic]

Smoking causes contamination of food with carcinogenic polycyclic aromatic hydrocarbons (PAH), and epidemiological evidence indicates a link between intestinal tract cancers and smoked food consumption. Using identical techniques, a collaborative study was undertaken to examine the PAH content of smoked foodstuffs in both the German Democratic Republic and in Hungary. No significant differences were found in either the mean values or ranges of the benzo[a]pyrene (BaP) contents in meats smoked by industrial processes in the GDR and Hungary. In the GDR, industrially smoked foods contained (average) 0.43 μg/kg, handicraft workshop produce 0.76 μg/kg, and home-smoked produce 0.74 μg/kg. The overall mean BaP content in smoked meat and sausage was 0.55 μg/kg. In Hungary, industrial produce contained 0.6 μg/kg, and home produce 0.74 μg/kg, the overall total being 0.7 μg/kg. The average BaP content of home-smoked (softwood smoke) products in Slovenian areas of Hungary was as high as 4.16 μg/kg, but in general the techniques in both countries permit production of smoked meat and sausage with a BaP content of <1 μg/kg. [See FSTA (1981) 13 9C296.] JRR

84

Carcinogenic polycyclic aromatic hydrocarbons in some Nigerian foods.
Emerole, G. O.
Bulletin of Environmental Contamination and Toxicology 24 (5) 641–646 (1980) [19 ref. En] [Biochem. Dep., Univ. of Ibadan, Ibadan, Nigeria]

To investigate the extent of polycyclic aromatic hydrocarbon contamination of smoked fish and smoked meat in Nigeria, samples of 6 types of fish (i) silver catfish *(Chrysichthys nigrogitatus)*, (ii) catfish *(Clarias dahomeyensis)*, (iii) African mudfish *(Clarias lazera)*, (iv) moonfish (*Citharinus* spp.), (v) snakehead *(Ophiocephalus obscurus)* and (vi) tilapia *(Tilapia nilotica)* and of smoked meat (suya) from Ibadan market were analysed. Results indicate the presence of 3 main polycyclic hydrocarbons in the fish while 4 components were present in the meat samples as identified by their R_f values on TLC and their fluorescence. 1,2 benzanthracene, a weak carcinogen was present in all fish spp. and the smoked meat studied. Lowest values were obtained in (i) and (v) with 2.5 and 1.6 μg/kg resp., while (iv) had the highest concn. (7.5 μg/kg). (v) and (ii) had only traces of benzo[*a*]pyrene. The remaining spp. ranged between 2.1 and 4.5 μg/kg. Smoked meat contained a relatively high concn. of both 1,2 benzanthracene and benzo[*a*]pyrene (15.5 μg/kg and 8.5 μg/kg) resp. The presence of these carcinogens at these levels might be a contributory factor to the reported high stomach cancer with the Ibadan community. VJG

85

[Device for treating foods.] Vorrichtung zum Behandeln von Nahrungsmitteln.
Koop, F.
German Federal Republic Patent Application
2 913 750 (1980) [De]

Device is described for smoking meat, sausage, fish, etc. As products pass through a smoke generating chamber water vapour charged with the smoke components condenses onto the products. A water heating container for steam generation, and a special steam overheating chamber connected to a steam transfer pipe are also described. W&Co

86

Smoked starch.
Ohira, T.; Mijano, R.; Yoshida, R. (Ajinomoto Co. Inc.)
UK Patent Application 2 050 798A (1981) [En]

In a preferred method a starch (maize, potato etc.) with 10–50% moisture and pH adjusted to 9–11, is smoked, at 10–80°C for 2 min to 3 h to give a product of pH 4–7 and of improved properties. These include the retention of its viscosity and gel-forming ability when heated and subsequently cooled which makes it suitable for use in a variety of foods, such as dairy products, confectioneries, soups and meat and fish pastes. FL

87

[Manufacture of smoked products from small, Black Sea fish.]
Skachkov, V. P.; Romas, L. A.; Sheveleva, V. A.
Rybnoe Khozyaistvo No. 1, 66–67 (1980) [Ru] [AzcherNIRO, USSR]

It was established under manufacturing scale conditions that Black Sea small fish (sprats etc.) frozen and brined, may be used with advantage for production of smoked fish products. Salt content should not exceed 7%. Finished products may be stored at 0–6°C for 15 days. Cold and hot smoking processes are described in detail. Sensory properties and chemical composition of finished products are also dealt with. STI

88

[Increased expansion in the range of smoked poultry meat products.]
Bobis, L.
Hydinarsky Priemysel 22 (3/4) 85–95 (1980) [Sk] [Vyskumny Ustav Hydinarskeho Priemyslu, Bratislava, Czechoslovakia]

The large possibilities of new developments are discussed in the range of smoked poultry meat products, e.g. various types of soft, semi-dry and dry sausages, poultry meat ham, liver wurst, frankfurters, mortadella etc. Experience with the hitherto existing range of products has been successful, and consequently further new developments are proposed, especially utilization of other kinds of poultry and combinations with other kinds of meat such as pork, beef and game. STI

89

[Methods and economic grounds for making proteins based on brewer's yeast and blood plasma in Yugoslavia.]

Gajger, O.; Ratkovic, D.

Tehnologija Mesa 21 (2) 40–42 (1980) [9 ref. Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

Yugoslav legislation permits addition of 3% of proteins of non-meat origin into canned meat products and smoked products; therefore the possible utilization of brewer's yeast (a by-product from beer fermentation) and blood plasma (slaughterhouse by-product) in dried form was studied. Belvit S is manufactured from residual brewer's yeast; manufacture of blood plasma is difficult due to problems associated with accumulation of blood, plasma separation and plasma drying. The available amounts of Belvit S and blood plasma seem to fully satisfy the needs of the meat industry. Data on beer manufacture and the relevant brewer's yeast yield, and available blood for plasma are given for the Yugoslav republics. STI

90

Factors affecting the acceptability of low-nitrite smoked, cured ham.

DuBose, C. N.; Cardello, A. V.; Maller, O.

Journal of Food Science 46 (2) 461–463 (1981) [15 ref. En] [Food Sci. Lab., US Army Natick R&D Command, Natick, Massachusetts 01760, USA]

2 experiments were conducted to evaluate consumer acceptance of samples of cooked, smoked ham which varied in $NaNO_2$ concn. and to evaluate the importance of 2 factors believed to affect their acceptability. The 1st experiment assessed the importance of colour to the overall acceptability of smoked ham. Results indicated that satisfactory colour in this product can significantly increase its acceptability, even when other attributes (e.g. flavour) of the product are inferior. The 2nd experiment assessed the effect of a warning of the possible dangers of $NaNO_2$ on the acceptability of the products. Results showed that the warning had no effect on consumer acceptance of the product.

91

Report on the scientific-technical activity for 1978.

Monzini, A.

Annali dell'Istituto Sperimentale per la Valorizzazione Tecnologica dei Prodotti Agricoli 9, 19–26 & 9–17 (1978) [En & It] [IVTPA, 20133 Milan, Italy]

The studies completed or in progress since the Institute named in the journal title moved to its new premises in 1978 are outlined. They cover various aspects of fruit and berry quality and preservation; conservation of meat and fish by freezing or smoking; and fruit and vegetable marketing problems. SKK

92

[Cold as an aid to improvement of sardines by smoking.]

Senesi, E.

Freddo 34 (6) 409–412 (1980) [11 ref. It] [IVTPA, Milan, Italy]

The production of smoked fillets of sardines is briefly described and effects of up to 6 months' storage at 0°C or up to 4 months at −30°C on sensory quality and microbial counts shown is a table. No falling-off in quality was observed during 4 months refrigerated storage of vacuum-packed smoked fillets, and the product remained acceptable for 6 months. Frozen storage was less satisfactory, with the product no longer acceptable after 3 months. RM

93

Smoke flavored hydrophilic liquid concentrate and process of producing same.

Underwood, G. L.; Wendorff, W. L. (Red Arrow Products Co.)

United States Patent 4 250 199 (1981) [En]

A brine flavour concentrate of hydrophilic liquid contains a min. of 2 mg/g phenolic materials extracted from smoke flavoured edible oil, and <1% titratable acidity per each 10 mg/g of phenol content. The proces of smoking and curing meat with the concentrate in brine as well as the smoked and cured meat itself are described. AS

94

[Dependence of vitamin content of brisket on the method of preparation.]

Krylova, N. N.; Karmyshova, L. F.; Kolesnikova, V. T.

Myasnaya Industriya SSSR No. 9, 36–37 (1980) [8 ref. Ru] [Vses. Nauchno-issled. Inst. Myasnoi Promyshlennosti, USSR]

Pork represents a significant source of B vitamins. The contents of thiamin and riboflavin may change in cooked products according to the method of preparation. A comparative study was carried out into the contents of thiamin and riboflavin in smoked pork joint (smoked using either the common method or a liquid smoking agent). It was established that when the meat was cured by means of hot smoke or a liquid smoking agent a small reduction of thiamin occurred (≤20%) in comparison to raw muscle; when cold smoke was used, the losses were negligible. Riboflavin losses did not exceed 15% when cold or hot smoke was used. The contents of thiamin in smoked/roasted and in roasted pork were 0.65 and 0.74 mg%, resp., and of riboflavin 0.071 and 0.080 mg%, resp.; when the liquid smoking agent was used the contents of thiamin were 0.66 and 0.72 mg% and of riboflavin 0.076 and 0.085 mg%, resp. STI

95

Ion enhanced smoke treatment of edibles.

Saurenman, D. G. (Consan Pacific Inc.)

United States Patent 4 250 804 (1981) [En]

Method and apparatus are described for more effective smoke treatment of edibles e.g. meat. Electrically charged ions are dispersed in the smoke, so causing the smoke particles to be attracted to the food. RAW

96

[New process for producing smoke for the smoking of foods [e.g. meat and fish products], and smoke generator to carry out this process.]
Capic - Etablissements Caillarec & Cie
French Patent Application 2 446 071 (1980) [Fr]

97

[Assessment of the possible mutagenic effect of preserved fish in oil treated with 'Vakhtol' smoking preparation.]
Karplyuk, I. A.; Volkova, N. A.; Gogol', A. T.
Voprosy Pitaniya No. 2, 67–68 (1980) [8 ref. Ru, en]
[Tsentral'nyi Inst. Usovershenstvovaniya Vrachei, Moscow, USSR]

In animal trials to assess the mutagenic effect of (i) oil preserved fish treated with Vakhtol' smoking preparation, sprats treated as (i) were compared with (ii) smoked sprats and a control (boiled fish). Cytogenetic analysis of bone marrow cells of mice fed (i) or (ii) showed that neither (i) nor (ii) had a mutagenic effect. RAW

98

[Effects of smoking on the available lysine content and in-vitro digestibility of fillets of *Sardina pilchardus*.]
Cesare, L. F. di; Senesi, E.; Moioli, F.
Tecnologie Alimentari 3 (7) 25–28 (1980) [16 ref. It, en]

Sardine fillets were brined for 5 min at 20°C in 26% NaCl solution, allowed to drip for 12 h at 0°C, then smoked in an Afos-Torry Mini Kiln for 45–360 min at 37°C, with a final pasteurization period at 82°C for 30 min. After cooling, the smoked fillets were packaged in plastics film of low O_2-permeability, and stored for ≤ 4 months at 0°C. At intervals, total phenols concn. and available lysine content were determined, together with in-vitro digestibility (using a trypsin/chymotrypsin/peptidase mixture). Tables and graphs of results are given. The results show that available lysine content and in-vitro digestibility decreased and total phenols content increased with increasing smoking time; the correlation between total phenols content and available lysine content was -0.94. The main decrease in available lysine concn. occurred during the first 90 min of smoking. Fillets smoked for different periods of time showed different patterns of decrease in available lysine content during storage. Brief smoking periods are recommended to maximize retention of nutritional value. AJDW

99

[Nitrites in meat products.]
Dakic, M.; Jovanovic, G.; Babic, L.
Hrana i Ishrana 21 (5/6) 113–115 (1980) [7 ref. Sh, en]
[Vet. Fak., Belgrade, Yugoslavia]

A total of 150 samples of meat products from shops in Belgrade was analysed for nitrite. Ranges of values for nitrite concn. (with number of samples studied in parentheses) were (mg%): cooked sausage (3) 0.1–0.5; scalded sausage (23) 0.6–16.5; non-ripened long-keeping-quality sausage (40) 0.2–15.2; ripened sausages (20) 0.06–8.2; cured backfat (9) 0.2–7.0; smoked meat products (19) 0.5–13.7; and canned meat products (36) 0.1–7.0. Results are presented in detail for various individual products within these groups. None of the samples studied exceeded current Yugoslavian tolerances for residual nitrite. The role of nitrite in nitrosamine formation is discussed, and the desirability of reducing residual nitrite concn. to the min. practical level is stressed. AJDW

100

[Composition of carbonyl fraction in smoke from selected types of wood.]
Borys, A.
Roczniki Instytutu Przemyslu Miesnego i Tluszczowego 15, 157–182 (1978) [36 ref. Pl, ru, en]
[Zaklad Tech. Miesa, Poland]

Composition of the carbonyl fractions of alder and fir wood smoke were investigated in a laboratory. Methods of detn. of oximes, dinitrophenylhydrazones and additional products with a sulphite were assessed. The carbonyl fraction of alder wood smoke contained 11 aliphatic ketones, 3 cyclic ketones, 7 carbonyl compounds with a furan ring, and 7 aromatic carbonyl compounds. The fir wood smoke contained 15 aliphatic ketones, 4 cyclic ketones, 7 carbonyl compounds with furan ring, and 13 aromatic carbonyl compounds. STI

101

[Separation and analysis of phenol fractions from smokehouse smoke. II. Separation, purification and analysis of phenol fractions.] Präparative Gewinnung und Analyse von Phenolfraktionen aus Räucherrauch. II. Gewinnung, Reinigung und Analyse von Phenolfraktionen.
Toth, L.
Fleischwirtschaft 60 (4) 728–730, 733–736 (1980) [10 ref. De, en] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

The phenolic compounds of smokehouse smoke can be completely condensed by scrubbing with water, provided that the aggregation of the smoke is first modified on a glass wool column. A crude extract is obtained from the neutral aqueous tar-free condensate by extraction with ethyl acetate. This extract is a smoke concentrate, with the phenolic compounds of smoke as its main components. Major constituents include monovalent smoke phenols, i.e. phenol, *o*-, *m*- and *p*-cresol, guaiacol and syringol and their alkyl derivatives, and the bivalent phenols pyrocatechol and its 4-methyl and 3-methoxy derivatives. A relatively pure phenol fraction free from polycyclic hydrocarbons was obtained by steam distillation at 170°C and partition chromatography on silanized silica gel. This fraction contains the mono- and bivalent phenols, as well as phenol aldehydes (vanillin, syringaldehyde) and their ketones (acetovanillone, acetosyringone). Besides the 25 known phenol compounds, capillary GLC allowed detection of >100 compounds with phenolic properties, mostly present at very low concn. (identification and toxicological trials await further studies). [See FSTA (1980) 12 11C457 for part I.] AS

102

[Device for treating foodstuffs.] Vorrichtung zum Behandeln von Nahrungsmitteln.
Koop, F.
German Federal Republic Patent Application
2 913 750 (1980) [De]

Apparatus for smoking meat, sausage, fish etc., for use in restaurants, canteens etc., has a heatable water reservoir for producing steam connected by a line to a separate steam superheating chamber, with an adjoining smoke generating chamber. The meat is smoked by the condensation of the superheated steam charged with the constituents of smoke produced by sawdust burning. W&Co

103

[Device for smoking fish.] Vorrichtung zum Räuchern von Fischen.
Dryer, H.
German Federal Republic Patent Application
2 914 357 (1980) [De]

Fish, particularly trout, are smoked in an oven containing a number of upwardly conveyed stacked trolleys for supporting the fish. The number of trolleys that can be stacked can be varied without adversely effecting the treatment. Only the outlet opening needs to be varied in accordance with the height of the stack. W&Co

104

Method for improving taste and stability of sausage.
Olson, D. G.; Wistreich, H. E. (B. Heller & Co.)
United States Patent 4 263 329 (1981) [En]

Method for improving the taste and stability of cooked or smoked and cooked sausage is described, i.e. immersion in an aqueous acidic solution containing lactic acid as an essential component at >25% by wt. alone, or in combination with other edible acids up to a total acidity of 20% by wt. AS

105

[Method of test for dry salted and smoked meat.]
Taiwan, National Bureau of Standards
Chinese National Standard CNS N6041, 3pp. (1979) [Ch]

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H. BROOKES

EDITOR

1

Brining procedures to produce uniform salt content in fish.

Kosak, P. H.; Toledo, R. T.

Journal of Food Science 46 (3) 874–876 (1981) [6 ref. En] [Food Sci. Dep., Univ. of Georgia, Athens, Georgia 30602, USA]

Inhibition of outgrowth and toxin production by *Clostridium botulinum* type E in smoked fish homogenates has been demonstrated at 3% NaCl in the water phase. Having the required salt content on a product that would not be too salty requires a uniform salt distribution throughout the fish. A 2-stage brining procedure was developed that resulted in min. differences in water phase salt contents between the thin and thick sections of a fish. The first stage involved soaking in 10% NaCl for 15 h, using a fish to brine ratio of approx. 1 lb to 1 l. A second stage soak in 2% NaCl for 24–48 h depending on the size of the fish leached out excessive salt in the thin sections of the fish while leaving the salt inside the thick sections. Analysis of samples from 4 different areas on the smoked fish brined using the 2-stage procedure revealed a uniform salt content. IFT

2

[Improved hot smoking of fish.]

Goncharov, A. M.; Kurko, V. I.

Rybnoe Khozyaistvo No. 4, 67–68 (1980) [1 ref. Ru] [VNIRO, USSR]

The optimal process parameters for fish processing in the "Vakhtol" smoke preparation were studied. The quality of the resultant product was assessed by the intensity of surface colour, sensory properties, and concn. of total phenolic compounds. The following optimal conditions for use of Vakhtol were obtained: temp. of use, 116.1°C; Vakhtol vapour flow rate, 0.7 m/s; dispersion of the smoking preparation, 16.9 min. Industrial trials produced smoked fish meeting the standard requirements. STI

3

[Utilization of the MINKh smoking solution for preserving frozen fish.]

Markina, E. V.; Lapshin, I. I.

Tovarovedenie 13, 39–43 (1981) [Ru]

Effect of the MINKh cold smoking solution on (i) Black Sea scad and (ii) mullet was studied. Samples were immersed in the smoking solution (at concn. of 1:7 or 1:15) for 10 days, frozen and then glazed. Controls for (i) and (ii) were frozen without pretreatment with the smoking solution, and glazed. Both test and control samples were stored in cartons at −12° to −14°C for up to 7 months. Data are tabulated on chemical composition of fat of frozen (i) and (ii) covering acid number (mg KOH), peroxide value (% I), and aldehyde value (mg % cinnamaldehyde) for 0, 60, 150 and 210 days storage. Acid number was low at start of storage (approx. 1–1.15), increasing to approx. 12.4–22 after 60 days, 21–33 after 150 days, and 22.7–33.6 after 210 days; peroxide value and aldehyde number were consistently lower in test than in control samples. Tabulated data on lipid composition of test and control samples cover fat content (%), total lipids (%), fat acidity (mg KOH), peroxide number (% I), and % of phospholipids, di- and triglycerides, sterols, sterol esters, hydrocarbons, and fatty acids. The greatest change was observed in lipid acidity number in (i), which increased from 1.06, 1.13 and 1.05 for controls, test samples (concn. 1:15) and test samples (concn. 1:7) resp. at storage onset, to 31.0, 23.3 and 21.4, resp. after 5 months storage. Changes in taste and aroma of semi-manufactured products from (i) and (ii) after 150 days storage were observed only in the controls. Organoleptic scores, based on appearance, colour, consistency, taste and aroma, are tabulated for test and control samples of semi-manufactured (i) and (ii) products after 45 days storage: total score was 23.36, 22.28 and 18.23 in (i) and 22.95, 22.02 and 15.83 in (ii) for controls, test samples (concn. 1:7) and test sample (concn. 1:15), resp. It was concluded that the cold smoking solution is an effective antioxidant. RAW

4

[Smoked fish product.]

Iwadare, S.

Japanese Examined Patent 5 615 849 (1981) [Ja]

Process is described in which bonito is immersed in a smoking solution produced by removing carcinogens from wood vinegar solution, followed by hot air drying. IFT

5

[Sanitary and hygienic characteristics of smoked meat products processed using the new smoking agent "Vakhtol".]

Gorodiskaya, V. D.; Yavorskii, M. I.; Vorob'eva, N. M.; Lapchenko, V. S.; Vasililiu, S. G.; Lukashevich, L. T.

Ratsional'noe Pitanie, Respublikanskii Mezhvedomstvennyi Sbornik No. 15, 40–44 (1980) [Ru] [Kievskii NII Gigieny Pitaniya, Kiev, USSR]

6

[Use of smoke concentrate and Belvit-S in semi-dry and cooked sausages.]

Trumic, Z.; Polic, M.; Oterbajn, O.; Rankov, M.

Tehnologija Mesa 20 (11) 311–313 (1979) [4 ref. Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

Studies on use of smoke concentrate and the protein preparation Belvit S for manufacture of semi-dry and cooked sausages is discussed: sausage recipes containing 6 or 8% hydrated textured vegetable protein are given. For these 2 recipes, optimum organoleptic properties of the finished product are given with, resp., 0.5% smoke concentrate + 0.7% Belvit S, and 0.7% smoke concentrate + 0.5% Belvit S. STI

7

[Chemical composition of the Bieszczadzki refined liquid smoke preparation.]
Borys, A.
Roczniki Instytutu Przemyslu Miesnego i Tluszczowego 16, 95-124 (1979) [17 ref. Pl, ru, en] [Inst. Przemyslu Miesnego & Tluszczowego, 02-532 Warsaw, Poland]

The Bieszczadzki refined liquid smoke preparation developed by the author's Institute in collaboration with the Lodz Polytechnic and covered by Polish Patent 85985 was fractionated by 2 methods (extraction with isooctane, or with sodium bisulphite); the fractions were separated by GLC and MS; the results were evaluated with the aid of a computer. A total of 173 compounds were identified in this way; their names and mol. wt. are tabulated for the different fractions, and chromatograms of the fractions are presented. The preparation is virtually free from benzo[a]pyrene, and consists essentially of 50% phenolic compounds, 30% acidic compounds, and 20% neutral compounds. [See also following abstr.] SKK

8

[Study of stability of the Bieszczadzki refined liquid smoke preparation in the form of gelatin emulsion.]
Chomiak, D.
Roczniki Instytutu Przemyslu Miesnego i Tluszczowego 16, 125-146 (1979) [8 ref. Pl, ru, en] [Inst. Przemyslu Miesnego & Tluszczowego, 02-532 Warsaw, Poland]

Emulsions containing the refined liquid smoke preparation [see preceding abstr.] and gelatin at 5 and 10, 5 and 5, 7.5 and 10, or 10 and 10%, prepared in the laboratory, were stored at 5-7°C or at room temp.; commercial emulsions containing resp. 5 and 5, 5 and 10, or 10 and 10% were stored at 5-7°C. The emulsions were examined at intervals during storage for ≤22 wk for content of the smoke preparation, gravimetrically after extraction with acetone, and by colorimetric detn. of phenols with 4-aminoantipyrine [see FSTA (1975) 7 5S629], and by GLC for contents of 15 components. The results are tabulated and graphically presented in detail. It is concluded that emulsions containing 10% preparation showed lower recoveries and rapidly lost solubility, and were therefore unsuitable for technological application; that smoke preparation contents in commercial emulsions were lower than in the laboratory emulsions, indicating the need for careful dosage; that among the 15 compounds examined, only *trans*-isoeugenol showed progressive losses during manufacture and storage; and that losses of *m*- and *p*-cresols did not occur in refrigerated storage. SKK

9

[Hygienic characteristics of new kinds of smoked meat products with added soy meal.]
Levintov, Zh. B.
Ratsional'noe Pitanie, Respublikanskii Mezhvedomstvennyi Sbornik No. 15, 37-40 (1980) [Ru] [Kievskii NII Gigieny Pitaniya, Kiev, USSR]

10

[Device for drying and if necessary smoking food stuffs.] Vorrichtung zum Trocknen und ggf. Räuchern von Lebensmitteln.
Schröter, M. (Erich Schröter oHG)
German Federal Republic Patent Application 2 926 496 (1981) [De]

The treating chamber for smoking or drying sausages and meats is connected with an air conditioning plant containing a spray water condenser, a compressor and a smoke generator. The spray water condensor is a vertical channel with rectangular cross-section, situated behind the treating chamber, and is connected to it via a suction channel. W&Co

11

[Study of phenolic compounds in smoked malt ordered by Japanese customers.]
Ondrisekova, M.; Sedova, V.
Kvasny Prumysl 27 (3) 58-64 (1981) [13 ref. Cs, ru, en, de] [Pivovary a Sladovne GRT, Bratislava, Czechoslovakia]

Gas chromatography was used for the analyses, the most suitable conditions being use of FFAP column (10%) on Chromosorb MHDS (60-80 mesh), column length 1.5 m, diam. 4 mm, column temp. 70-250°C (10°C/min), injector temp. 300°C, and N_2 as carrier gas (flow rate adjusted so that the standard peak was obtained 17 min after in-feed). The peak height for the phenols was compared with the standard peak, which is thought to be dependent on the guaiacol reaction, and the area of which does not change with rate of malt smoking. The malt was considered satisfactory when the phenol + ortho-cresol peak was higher than the standard peak height multiplied by 1.6. STI

12

[Smoked cheese.]
Rokko Butter KK
Japanese Examined Patent 5 607 649 (1981) [Ja]

Smoked cheese is prepared using a smoke which has had its water solubles reduced by contact with water. IFT

13

[Effects of smoking temperature on post-mortem change of porcine *longissimus* muscle. Changes of ATP-derivatives, glycogen and lactic acids.]
Kuiura, T.; Umezawa, K.; Saito, Y.
Bulletin of the College of Agriculture and Veterinary Medicine, Nihon University [Nihon Daigaku Nojoigakubu Gakujutsu Kenkyu Hokoku] No. 38, 160-164 (1981) [7 ref. Ja, en] [Lab. Food Manufacturing, Coll. Agric. & Vet. Med. Nihon Univ. Japan]

Pork *longissimus* muscle was smoked at various temp. and several components were measured. Glycogen and lactic acid contents were unaffected by smoking temp. Inosine and hypoxanthine were the major nucleotides identified (others were inosine monophosphate, adenosine monophosphate, ADP and ATP), and both gave higher concn. at higher smoking temp. [From En summ.] LH

14

Identity of microorganisms from 'khundi' –a smoked meat.
Faparusi, S. I.
Journal of Food Protection 44 (8) 581–582 (1981) [6 ref. En] [Biochem. Dep., Univ. of Ibadan, Ibadan, Nigeria]

Microorganisms from 45 pieces of 'khundi', a dried and smoked meat produced from beef and mutton, were cultured on various media. Twelve species of bacteria, yeats and moulds were isolated during a period of 20 months. The microorganisms were compared with those obtained from two raw ingredients, fresh beef and mutton. There were similarities between the raw and dried meats. Some of the microorganisms are known to produce toxins which might be the cause of illnesses often reported after the consumption of 'khundi' meat. AS

15

[Temperature zones in smoke generators.]
Zotov, V. V.
Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 1, 44–47 (1981) [11 ref. Ru] [Moskovskii Tekh. Inst. Myasnoi i Molochnoi Promyshlennosti, Moscow, USSR]

On the basis of studies of analytical models, heat zones in smoke generators, e.g. for meat products, of various types were compared. The formation of carcinogens in the smoke was also studied. The content of carcinogens could be reduced when smoke generators of the endothermal type were used, i.e. generators with energy fed from external heaters of various types. The most efficient smoke generators were those in which energy was supplied by means of a heat-transfer agent. STI

16

Smoke generator for smoking food products.
Kerres, S.
United States Patent 4 270 464 (1981) [En]

Method and device are described for smoking food products such as meat, sausage and fish. Smoke is produced from glowing sawdust maintained at a temp. just below the flame point in the presence of excess oxygen. The smoke produced is low in tar and carbon, and the food product produced has out-standing smell and taste, and has excellent colour uniformity. AS

17

[Lethality of hot smoking of fish on *Clostridium botulinum* type E.]
Zaleski, S. J.; Fik, A.; Koronkiewicz, A.
Przemysl Spozywczy 34 (8) 302–304 (1980) [23 ref. Pl, ru, en, fr, de] [Zaklad Mikrobiol. Zywnosci, AR 71-424 Szczecin, Poland]

Time/temp. conditions of hot smoking of fish were studied in 5 Polish fish factories smoking respectively headless cod, 'Mintaj', mackerel, halibut pieces, and Baltic herring. Oven air temp., and temp. at the coldest point of a control Baltic herring placed centrally on the smoking frame were measured every 5 min during the drying phase, and every min during the cooking and smoking phases. The results are tabulated in detail together with the processing temp. recommended in the processing instructions. The lethality coeff. calculated for the smoking procedures in the 5 factories were resp. 1408, 3.66, 66.47, 84.77 and 1036 compared with a value of 1371 corresponding to a temp. of 82.2°C in the coldest point of a fish in the coldest part of the oven maintained for 30 min as required by the Milwaukee Ordinance of 1964 as quoted by Pace & Krumbiegel [FSTA (1973) 5 6R254]. It is concluded that fish smoking described as 'hot smoking' was mostly carried out in Poland in time/temp. conditions intermediate between cold and hot smoking. Drastic improvement of smoking and control procedures is recommended. 1 of 102 samples of hot smoked herring taken at random (processing conditions not studied) was found to contain live *Clostridium botulinum* type E spores. SKK

18

[Flavouring of skin with spices and smoke concentrate.]
Polic, M.; Dimitrijevic, D.; Djordjevic, M.; Lajinscak, J.
Tehnologija Mesa 22 (1) 23–25 (1981) [4 ref. Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

The need for flavouring of pig skin for use in meat products in discussed. Trials showed that good results were achieved by flavouring skin products with a mixture of 1% smoke concentrate, 0.05% cumin, 0.05% mace, 0.03% rosemary and 0.1% garlic. Skin flavoured in this way may be used in meat products, e.g. luncheon meat. Sausages may be made with 15–30% of a skin suspension flavoured with 0.03% rosemary and 1% smoke concentrate. STI

19

Sonic smoke dispenser saves meat packer $20 000 annually.
Clemens, K. W.; Saal, H.
Food Processing 41 (9) 72–73 (1980) [En] [Hatfield Packing Corp., Hatfield, Pennsylvania, USA]

A dispersant nozzle for liquid smoke, used in meat product smoking operations, consists of a resonator cavity into which compressed air is injected creating a standing sonic wave. The energy of this wave is used to produce a fine fog from liquid smoke, flavour enhancers, deodorizers, etc. which are applied to the meat either in continuous smoking tunnels or in batch ovens. The problems of smoke generation from sawdust are avoided, and the smoking medium gives a more homogeneous product. JRR

20

[A case of botulism – special aspect of food examination.] Ein Fall von Botulismus unter dem besonderen Aspekt der Diagnose am Lebensmittel.
Schulze, K.; Funke, R.
Archiv für Lebensmittelhygiene 32 (3) 83–87 (1981) [many ref. De, en] [Veterinäruntersuchungsamt des Landes Schleswig-Holstein, 2350 Neumünster, Federal Republic of Germany]

A case of botulism following consumption of raw cured smoked ham is described. *Clostridium botulinum* serotype B was isolated from the suspect ham. The strain was able to grow and produce toxin at room temp. and at 11°C. Growth was greatly inhibited at 37°C. AS

21

[Centrifugal electroflotation treatment of industrial [meat smoking plant] effluents.]
Perekhoda, V. I.; Sokolov, N. V.
Myasnaya Industriya SSSR No. 2, 19–20 (1981) [4 ref. Ru] [Moskovskii Tekh. Inst. Myasnoi i Molochnoi Promyshlennosti, Moscow, USSR]

22

Determination of α-dicarbonyl compounds in cigarette smoke.
Moree-Testa, P.; Saint-Jalm, Y.
Journal of Chromatography 217, 197–208 (1981) [9 ref. En] [Res. Dep., SIETA, 53 Quai d'Orsay, 75340 Paris Cedex 07, France]

The method of derivatization by formation of nitrogenous heterocycles proposed for the detn. of α-dicarbonyl compounds was found sufficiently selective and sensitive for direct application to HPLC analysis of the complex cigarette smoke-mixture. It is expected that the method could also be applied to the complex mixtures encountered in food production, in which α-dicarbonyl compounds are important for organoleptic reasons. AL

23

[Improved method for quantitative isolation of benzo[*a*]pyrene from foods.] Verbessertes Verfahren zur quantitativen Abtrennung von 3,4-Benzpyren in Lebensmitteln.
Gertz, C.
Zeitschrift für Lebensmittel-Untersuchung und -Forschung 173 (3) 208–212 (1981) [28 ref. De, en] [Chem. Untersuchungsamt der Stadt Hagen, Pappelstrasse 1, D-5800 Hagen, Federal Republic of Germany]

Benzo[*a*]pyrene and other polycyclic aromatic hydrocarbons (PAH) are extracted directly from food without prior saponification by using light petroleum and the nonionic detergent Triton X-100. The benzo[*a*]pyrene and PAH are then extracted into a formic acid phase as caffeine complexes and back-extracted into light petroleum after dilution with salt solution. After concentration the light petroleum extract is cleaned up by column chromatography on a Sep-pak cartridge (Waters). After clean-up, samples are analysed by HPLC (LiChrosorb RP-18, water/ethanol 85 + 15 eluent) or TLC. Quantitation is by fluorescence detection. Recoveries of benzo[*a*]pyrene from milk, butter, smoked bacon and fish and sunflower oil (fortified at 0.24–1.20 ng/g) were 92–98%. Limit of detection with TLC was 0.05 ng/g and with HPLC, 0.2 ng/g. Because of differing spectral properties of different PAH, the method is only suitable for analysis of single compounds, such as benzo[*a*]pyrene. DIH

24

Modified liquid smoke composition and food casings prepared therefrom.
Chiu, H. S. (Union Carbide Corp.)
United States Patent 4 278 694 (1981) [En]

Aqueous liquid smoke compositions are described. They are used to prepare food casings that impart smoke flavour and colour to food products processed in the packaging, e.g. meat products. AS

25

Profits up in smoke.
Philip, M.
Catering and Hotel Management 53 (10) 21–22 (1981) [En]

A discussion of the processes and equipment involved in small-scale smoking, applicable to most meat, fish, and poultry is presented. The microbiological and sensory acceptability of such products is considered, e.g. smoked salmon, as a chilled or frozen product containing 5.5 and 3.0% salt was evaluated, and both frozen samples were rated as excellent microbiologically and sensorily, whereas only the chilled product with 5.5% NaCl was acceptable, and it was only rated as 'good'. LH

26

[Destruction of salmonellae during the manufacture of boiled smoked sausage.]
Iordanov, I.; Zakhartsev, Ts.; Dimitrov, Ya.
Veterinarnomeditsinski Nauki 17 (6/7) 87–94 (1981) [18 ref. Bg, ru, en] [Tsentralen Nauchno-izsled., Veterinaromeditsinski Inst., Sofia, Bulgaria]

Destruction of salmonellae in broth cultures was studied in laboratory (7 serotypes) and production (4 serotypes) trials. In the laboratory trials (73) the cultures were heated in a water bath following the thermal curve for the production of boiled-smoked sausage. Production trials (ii) were performed on Macedonian (diam. 30–40 mm), Kamchia (diam. 50–60 mm), and 'Rousse' (diam. 80–100 mm) sausages inoculated with broth culture. Density of bacterial cells in both broth and minced meat was 2–42 $\times 10^6$/cm^3. The critical destruction temp. for in vitro trials on *Salmonella enteritidis*, *S. agona*, *S. typhimurium*, *S. oranienburg*, *S. choleraesuis*, *S. anatum* and *S. lexington* was 62°C, and for production trials on *S. typhimurium*, *S. enteritidis*, *S. dublin* and *S. choleraesuis* it was 64°C. It was concluded that the destruction of salmonellae was dependent on the critical temp. attained and independent of serotype or sausage diam. and type. When isolating salmonellae in meat products during heat treatment, preliminary concn. in peptone broth is considered necessary with subsequent seeding on solid and liquid selective nutrient media. [From En summ.] RAW

27

Method for inhibiting the growth of *Clostridium botulinum* and the formation of enterotoxin in smoked fish products.
Thompson, J. S.; Jadlocki, J. F., Jr. (FMC Corp.)
United States Patent 4 277 507 (1981) [En]

The growth of *Clostridium botulinum* and the production of enterotoxin in smoked fish is inhibited by adding to the fish a compound selected from hypophosphorous acid and its sodium, potassium, calcium and manganese salts. Such an additive may be combined with minor amounts of sodium nitrite. AS

28

A typical local product obtained from buffalo milk: "La Mozzarella".
Citro, V.
Scienza e Tecnica Lattiero-Casearia 32 (4) 263–270 (1981) [En, It]

Mozzarella cheese originated in the Battipaglia region of Italy, where swamps favoured the rearing of water buffaloes. The buffaloes' milk is coagulated with liquid rennet at about 36°C and after 70–90 min the curd is broken up and put into copper strainers to drain off whey (which is boiled to make Ricotta cheese). The curd is then cut into large pieces, placed on a table to complete whey drainage, minced, and cooked in boiling water. Portions of curd are then removed, worked by hand at 60–65°C and finally brined in fibre glass basins. The cheese is eaten within 3–4 days. Provola cheese is similar to Mozzarella but is smoked, can be kept for about a day longer, and is slightly larger (400–800 vs. 200–600 g). ADL

29

[Mass spectrometry of aroma compounds in fish preserves.]
Lapshina, L. I.; Dulan, L. A.; Mokhnachev, I. G.; Kas'yanov, G. I.
Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 2, 10–13 (1981) [4 ref. Ru] [Moskovskii Ordena Trudovogo Krasnogo Znameni Inst. Narodnogo Khozyaistva im. G. V. Plekhanova, Moscow, USSR]

The composition of aroma compounds in the volatile phase present in canned fish and distillable by steam (phenols, acids, carbonyl compounds, bases) was studied by MS. Investigation was carried out with canned smoked fish in oil for the preparation of which the smoking fluid Minch was used. Careful investigation of results showed that the specific aroma of smoked canned fish is formed by 11 phenolic compounds, 10 acids, 3 amines and 5 carbonyl compounds. STI

30

Preparation of Masmin – an improved method.
Muraleedharan, V.; Valsan, A. P.
Fishery Technology 17 (2) 99–101 (1980) [3 ref. En] [Calicut Res. Cent. of Cent. Inst. of Fisheries Tech., Calicut-673 005, India]

An improved method for the preparation of 'Masmin', the traditional smoked tuna of the Lakshadweep islands, is described. Fillets of fresh tuna (*Euthynnus affinis*) were cut lengthwise (5 cm thick, 15 cm long) washed in water, dipped in saturated brine (1 kg NaCl:1l water) for 30 min and exposed to steam for 1 h, sun dried to about 40% moisture and smoked for 4 h until the development of glossy appearance, brown colour and smoky flavour. The smoked strips were dried to 10% moisture. The new product contained less NaCl (1.6%), more amino N (0.5702%) and had better digestibility than traditionally prepared 'Masmin'. CFTRI

31

[Polycyclic aromatic hydrocarbons in smoked fish from Central Africa. I. Development of a qualitative and quantitative analytical method.]
Mossanda, K.
Revue des Fermentations et des Industries Alimentaires 35 (3) 99–107 (1980) [Fr] [Lab. d'Analyse des Denrees Alimentaires, Univ., Liege, Belgium]

Full details are given of a TLC method for detection and detn. of polycyclic aromatic hydrocarbons (PAH) in smoked fish. The sample is saponified by KOH in methanol, and after filtration, residue is refluxed in cyclohexane. The methanol/cyclohexane extracts are combined and extracted with cyclohexane, bases are removed from the cyclohexane phase by extracting with HCl, and PAH are obtained by partitioning into dimethyl formamide. PAH are purified by successive column chromatography on silica gel and alumina, eluting with solvents of increasing polarity (hexane/benzene 95:5, 50:50, benzene, benzene/ether 80:20). Fractions eluted from alumina by the different eluents are analysed separately by 2-dimensional TLC, developing the 1st dimension in hexane/toluene 90:10 and the 2nd in methanol/ether/water 40:40:10. Individual spots may be further purified by TLC if necessary. Patterns given by TLC of reference PAH are shown; individual PAH are identified and quantitated by UV spectrophotometry; absorbance max. and min. for 16 PAH are tabulated. Recoveries of 9 PAH through the whole method were 74–82%. DIH

32

[Polycyclic aromatic hydrocarbons in smoked fish from Central Africa. II. Identification and evaluation of polycyclic aromatic hydrocarbons in smoked fish from Central Africa.]
Mossanda, K.
Revue des Fermentations et des Industries Alimentaires 35 (4) 132–136 (1980) [8 ref. Fr, en, nl] [Lab. d'Analyse des Denrees Alimentaires, Univ., Liege, Belgium]

Contents of polycyclic aromatic hydrocarbons (PAH) in samples of 3 types of fish (Tilapia, Lofumbe, Mongusu), smoked in accordance with usual practice in Central Africa, were determined. Results are tabulated for 15 PAH; the 3 fish types contained broadly similar levels of corresponding PAH, although Lofumbe tended to have lower concn. than the other 2. Contents in meat (μg/kg) of some individual PAH were as follows: anthracene 178–343; phenanthrene 238–377; pyrene 57–133; fluoranthene 113–145; benz[*a*]anthracene 25–29.5; benzo[*a*]pyrene 8.4–25.9; benzo[*e*]pyrene 7.3–34; benzo[*b*]fluoranthene 8.8–11.3. Contents of PAH in smoked Central African fish were higher than those produced industrially (10–40 ×) but comparable to those in fish smoked under artisanal conditions in Iceland and Japan. [See preceding abstr. for part I.] DIH

33

Possible toxic components in smoked fish products. (In *'Food from the sea'*[see FSTA (1982) 14 5R281].) [Lecture]
Connell, J. J.; Gibson, D.; Hardy, R.; Mackie, P. R.; McGill, A. S.; McLeod, D.
pp. 221-228 (1981) [5 ref. En] [Torry Res. Sta., 135 Abbey Road, Aberdeen AB9 8DG, UK]

Studies on toxic compounds in smoked fish products are described. Data are presented for concn. of polynuclear aromatic hydrocarbons (PAH), chlorophenols (CP) and chlorinated dibenzo-*p*-dioxins (CDPD) in cod and herring smoked in a commercial-type smoking unit, and croaker smoked by the traditional Nigerian method. Concn. of PAH differed considerably between samples, but increased with increasing intensity of smoking. No CDPD were detected in any sample. Concn. of pentachlorophenols were low in most samples, but highest (3.6 parts/billion) in heavily-smoked red herrings. Tetrachlorophenol concn. were higher than pentachlorophenol concn., reaching 1228 parts/billion in red herrings. Mutagenicity tests showed no mutagenic acitivity in solutions prepared by bubbling smoke through water; dimethyl sulphoxide extracts of the outer layer of smoked fish showed mutagenic activity, this being greater for the cut surface than the skin surface of the fillet. AJDW

34

[Contents of 3,4-benzpyrene in fish processed by various smoking technologies.]
Dikun, P. P.; Kostenko, L. D.; Shendrikova, L. D.; Emshanova, A. V.; Nikitin, B. N.
Rybnoe Khozyaistvo No. 5, 78-79 (1981) [Ru] [NII Onkologii im. N. N. Petrova, USSR]

Fish samples taken periodically from different smoking equipment were analysed and the content of 3,4-benzpyrene established. The samples studied were of 3 groups: smoked fish using equipment of the Querner-Bruck type; fish from smoke generator SG-2; and fish smoked by means of the curing preparation Vakhtol. In the first 2 cases benzpyrene was found in fish at concn. of 1.6-39.0 µg/kg (mean 9.7 µg/kg), vs. 0-1.2 µg/kg in fresh fish. The use of the curing preparation proved to have good prospects. STI

35

Method for inhibiting the growth of *Clostridium botulinum* and the formation of enterotoxin in smoked meat products.
Jadlocki, J. F., Jr.; Thompson, J. S. (FMC Corp.)
United States Patent 4 282 260 (1981) [En]

The growth of *Clostridium botulinum* and the production of enterotoxin in smoked meat products, such as bacon, is inhibited by adding to the meat products a compound, i. e. hypophosphorous acid or its Na, K, Ca or Mn salts. AS

36

Smoking of foods: methods and some toxicological aspects.
Hardy, R.; McGill, A. S.
Process Biochemistry 14 (11) 2, 4 (1979) [17 ref. En] [Torry Res. Sta., Aberdeen, UK]

Past and present methods of smoking foods are surveyed. Effects of smoking on the toxicology of products are discussed with reference to numerous toxicological studies carried out on smoked foods. SP

37

Smoking of foods. [Review]
Clifford, M. N.; Tang, S. L.; Eyo, A. A.
Process Biochemistry 15 (5) 8, 10-11, 17, 26 (1980) [103 ref. En] [Dep. of Biochem., Univ. of Surrey, Guildford, Surrey, UK]

Chemical aspects of the smoking process and the resultant products are reviewed under the headings: wood pyrolysis; factors affecting woodsmoke composition and absorption, including type of wood, moisture content of wood, wood combustion temp., smoke house humidity, air flow and smoke treatments; time of smoking; effect of smoking on food, such as changes in nutritive value; texture of smoked foods; colour of smoked foods; flavour of smoked foods; polycyclic aromatic hydrocarbons; bacteriostatic properties of wood smoke; and antioxidative properties of wood smoke. SP

38

[What is smoke? New information on food smoking using recycling plants and microprocessors for hot smoking and conditioning – a new kind of technology bringing a rational change in smoking techniques.]
Was ist Rauch? Neue Erkenntnisse auf dem Gebiet des Räucherns mittels Recycling-Anlagen sowie Mikroprozessoren in der Heissräucher- und Klimatechnik. Eine neue Technologie-Generation und der rationelle Umbruch in der Räuchertechnik.
Stührmann, J.
Fleischwirtschaft 61 (9) 1238, 1241-1242, 1244, 1246; 1363-1365 (1981) [De, en] [VEMAG, Postfach 1620, D-2810 Verden, Federal Republic of Germany]

39

[Smoking of meat and meat products.] [Review]
Talon, R.; Girard, J.-P.
Actualites Scientifiques et Techniques dans les Industries Agro-alimentaires, Centre de Documentation Internationale des Industries Utilisatrices de Produits Agricoles No. 25, 105pp. (1980) [210 ref. Fr, en, de]

Aspects considered in this review include: methods for generation of smoke; characteristics of the smoke, in relation to smoking method; smoking methods; composition of the smoke, and factors influencing it; quality of the smoked product, with reference to effects of smoking on colour, flavour and keeping quality, and the antioxidant, bacteriostatic and bactericidal action of smoke; presence of polycyclic aromatic hydrocarbons in smoke; and effects on contents of vitamins and amino acids in the smoked product. AJDW

40

[Separation and analysis of phenol fractions from smokehouse smoke. III. Separation and identification of mono- and dihydroxy compounds.] Präparative Gewinnung und Analyse von Phenolfraktionen aus Räucherrauch. III. Trennung und Identifizierung der Mono- und Dihydroxyverbindungen.
Wittkowski, R.; Toth, L.; Baltes, W.
Zeitschrift für Lebensmittel-Untersuchung und -Forschung 173 (6) 445–457 (1981) [28 ref. De, en] [Inst. für Lebensmittelchem. Tech. Univ., Müller-Breslau-Strasse 10, Berlin]

In order to characterise smoke composition as fully as possible a phenolic extract was obtained by a mild procedure from a beech wood smoke condensate by a previously described method [see part II, FSTA (1981) 13 12A808] and fractionated into mono- and dihydroxy compounds by a sodium borate treatment. The phenol extract is dissolved in ethyl acetate and shaken with 5% $Na_2B_4O_7$. The dihydroxy compounds are recovered from the borate solution (after separation from the ethyl acetate) by bringing it to pH 1 with phosphoric acid and extracting with ethyl acetate. Trimethylsilyl derivatives of phenols are prepared and studied by GLC-MS, using glass capillary columns coated with SE-30, OV-17 or Carbowax 51. Extensive tabulated data list GLC peaks obtained in each fraction, MS data, tentative or confirmed identification and structure of identified compound. 119 phenols were detected, 62 of which were structurally identified. 20% of the phenolic extract was dihydroxybenzenes; this contrasts with earlier studies that found only trace amounts of these compounds. The main dihydroxybenzenes found (74%) were pyrocatechol (1,2-dihydroxybenzene) and its 4- and 5-methyl, 3-methoxy and 3- and 4-ethyl derivatives. 5 other phenols with 2 free —OH groups were structurally identified. DIH

41

[Application of smoking processes.]
Sirami, J.
Viandes et Produits Carnes 2 (6) 8–13 (1981) [4 ref. Fr] [ADIV, Clermont-Ferrand, France]

Comparative studies were conducted on smoking of bacon by traditional methods and by electrostatic smoking with product/electrode distances of 20 or 80 cm. Aspects covered include flavour, colour, and contents of carbonyls, phenols and benzo[a]pyrene. Tables of results are given. The results show that, for equal smoking times, electrostatic smoking (electrode/product distance 20 cm) gave 1.3–1.4 × the phenols concn., 1.2–1.8 × the carbonyl compounds concn. and 4 × the benzo[a]pyrene concn. observed for traditionally-smoked samples. Acceleration of smoked flavour development as a result of electrostatic smoking was less marked than acceleration of colour development. AJDW

42

[Means for producing non-transparent coatings on meat products.] Mittel zum Herstellen von undurchsichtigen Schutzüberzügen auf Fleischwaren.
Stemmler, M.; Stemmler, H.
German Federal Republic Patent Application 3 012 192 (1981) [De]

Protective coatings are described that can be applied to smoked meat products such as raw sausage and raw meat; final products include salami and ham. The coating contains: distilled, partially acetylated monoglycerides; artificial wax selected from paraffin waxes and (optionally) microcrystalline waxes; cellulose ester; and pigments. The protective coating is not transparent, is thin, and is easily detached from the meat product. W&Co

43

Effect of nitrite content and smoking on yield, shelf-life, and palatability of Cornish game hens.
Goodwin, T. L.; Ikeme, A. I.
Poultry Science 60 (3) 679–682 (1981) [11 ref. En] [Dep. of Anim. Sci., Univ. of Arkansas, Fayetteville, Arkansas 72701, USA]

Effects of nitrite and smoking on yield and palatability of Cornish game hens were studied: carcasses were (i) injected, (ii) soaked or (iii) injected + soaked with 6.98% pickling brine before smoking. Cooking temp. was 46°C for 2 h, followed by smoking at 93°C for 5 h. Yield, nitrite content, NaCl content, rancidity development and palatability were evaluated. NaCl and nitrite contents were highest in (iii) samples. White meat appearance was better for (iii) than for (i) or (ii); dark meat appearance was better for (ii) than for (i) or (iii). Meat from (iii) was the juiciest. General acceptability and flavour were highest for (iii) white meat and (ii) dark meat. The treatments studied did not significantly influence rancidity or yield. AJDW

44

[32nd Meeting of the Bavarian Regional Group on 9 April, 1981 in Munich.] 32. Arbeitstagung des Regionalverbandes Bayern am 9. April 1981 in München.
Germany, Federal Republic of, Gesellschaft Deutscher Chemiker
Lebensmittelchemie und Gerichtliche Chemie 36 (1) 16–20 (1982) [De]

Abstracts are given of papers presented at this meeting including the following. Labelling – is food legislation becoming labelling legislation? by M. Horzt (pp. 16–17). Determination of trade usages in relation to Brühwurst sausage, by R. Hallermayer (p. 17). Smoking – an old process from the viewpoint of food chemistry, by L. Toth (pp. 17–18). Small-scale rheological studies on dough and gluten, by R. Kieffer & H.-D. Belitz (p. 18). Detection of reductones in sugar-amino acid reaction mixtures and foods, by F. Ledl, G. Fritsch & T. Severin (p. 18). High-sensitivity detn. of and the occurrence of lysinoalanine in milk protein-containing foods, by R. J. Fritsch & H. Klostermeyer (pp. 19–20). AJDW

45

[Refrigeration of fish after drying and smoking.]
Nikitin, B. N.
Rybnoe Khozyaistvo No. 2, 71–74 (1980) [Ru]
[Giprorybflot, USSR]

Kinetics of chilling smoked and dried fish in an experimental unit using various parameters for the chilling air are given. The fish processed ranged from 135–235 mm in length and weighed from 15–360 g. Baltic herring, Atlantic mackerel, hake and other fish were studied. Chilling hot-smoked fish up to 300 mm in length from 70°C to 20–30°C must be carried out with outside air or room air. Further chilling to packaging temp. (16–18°C) is slow. After packaging, the fish is chilled to 4–8°C (i.e. storage temp.). The rate of chilling hot-smoked fish is 2.6–3.4°/h; for cold-smoked fish the rate is 1.6–2.4°/h.   STI

46

[Contents of N-nitrosamines in fish and some types of fish preserves.]
Dikun, P. P.; Romanova, L. E.; Shendrikova, I. A.; Reim, N. D.; Yunusova, Z. Yu.
Rybnoe Khozyaistvo No. 8, 69–73 (1980) [1 ref. Ru]
[NII Onkologii im. Prof. N. N. Petrova, USSR]

Content of nitrosamines in smoked fish in oil and in frozen and smoked fish (sprats, cod) was studied; the total content of nitrosamines was determined colorimetrically, and individual nitrosamines were determined by gas chromatography. Frozen fish contained mainly dimethyl nitrosamine and diethyl nitrosamine. Colorimetric studies revealed some other nitrosamines. The contents of nitrosamines depend on fish type and degree of decomposition of the original nitrosamines, which is affected by the oil used; thus the total of nitrosamines in preserved products may be lower vs. that in the raw material.   STI

47

Combination of potassium sorbate and irradiation treatments to extend the shelf-life of cured fish products. (In *'Combination processes in food irradiation'* [see FSTA (1982) 14 8C331].) [Lecture]
Maha, M.; Sudarman, H.; Chosdu, R.; Siagian, E. G.; Nasran, S.
pp. 305–318 (1981) [16 ref. En] [Cent. for the Application of Isotopes & Radiation, Nat. Atomic Energy Agency, Jakarta, Indonesia]

Studies on shelf-life extension of 3 kinds of cured fish product, i.e. salted chub mackerel (*Rastrelliger neglectus*), boiled chub mackerel and smoked milkfish (*Chanos chanos*) were made using a combined potassium sorbate and irradiation treatment. An integrated process for the preparation of each cured product provided with the combined treatment is described. Total bacterial count, total volatile base N, content of volatile reducing substances and mould growth were used as objective indices of quality in comparison with sensory evaluation to determine the shelf-life of the products held under ambient conditions. It was found that a potassium sorbate residue of 0.1%, followed by irradiation up to 4 kGy could retard mould growth on the products and extend the shelf-life considerably in comparison with the commercially prepared products.   AS

48

Polycyclic aromatic hydrocarbons in smoked fish.
Larsson, B. K.
Zeitschrift für Lebensmittel-Untersuchung und -Forschung 174 (2) 101–107 (1982) [15 ref. En, de] [Nat. Food Admin., Food Lab., Box 622, S-751 26 Uppsala, Sweden]

The levels of polycyclic aromatic hydrocarbons (PAH) were determined in 70 samples of smoked fish and fish products. By application of capillary gas chromatography with flame ionization detection 13 PAH components were determined simultaneously. In 19 of 46 samples of commercially smoked fish, mainly from traditional kilns, the concn. of benzo[α]pyrene (BaP) exceeded 1 μg/kg. The BaP levels in the samples from kilns with external smoke generation were without exception <1 μg/kg. Four of 16 canned smoked fish samples contained >1 μg/kg of BaP. A sample of "home-smoked" herring from a home-made bricked kiln showed the highest level of BaP and total PAH in this study, 11.3 and 1100 μg/kg, resp.   AS

49

[Smoking of salmon. Influence of raw material quality on the antiseptic action of smoke.]
Malle, P.; Eb, P.; Tailliez, R.
RTVA 20 (172) 25–28, 30–31 (1981) [23 ref. Fr] [Lab. des Services Vet., Boulogne-sur-Mer, France]

Studies were conducted on effects of exposure to smoke, in the presence or absence of salmon tissue or various constituents, on survival of *Escherichia coli*. Studies on agar plates showed survival of *E. coli* to decrease with duration of smoking, the decrease being slower in the presence of a salmon homogenate. Constituents found to inhibit the bactericidal activity of smoke included, in order of increasing inhibitory activity, albumins, peptones, glucosamine, amino acids and ptomaines. Lipids, glucose and NaCl had no significant effect on bactericidal activity of smoke. It is concluded that bactericidal activity of smoking is maximized by use of very fresh raw material.   AJDW

50

[Nitrites in sausages smoked in an "out house".]
Jarmund, T.
NINF Informasjon No. 1, 60–61 (1982) [No]

In this brief report of a case history, tests showed that sausages smoked in a traditional "out house" contained 15–40 mg nitrites/kg, vs. 0 in the raw sausage meat and 0 in samples treated by modern smoke generators. Analysis showed that the alder wood used traditionally contained 4 × as much N as birch wood, and that the nitrite contents were attributable to use of the alder wood.   HBr

51

[Influence of smoking technology on smoke components in meat products.] Einfluss der Räuchertechnologie auf Rauchbestandteile in Fleischerzeugnissen.
Toth, L.
Fleischwirtschaft 62 (2) 172, 174–178; 200 (1982) [2 ref. De, en] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

This paper discusses current knowledge on desirable and harmful smoke components, and makes the following practical proposals: short smoking times; avoiding soot and tar deposition on the products; low smouldering temp. in smoke generation; use of precooled smokehouse smoke; and use of removable casings. RM

52

[Study of effect of concentration, and manufacturing and storage conditions on stability of emulsion of a new Polish liquid smoke preparation.]
Chomiak, D.
Gospodarka Miesna 32 (10) 37–41 (1980) [7 ref. Pl]

A new liquid smoke preparation has recently been placed on the Polish market. No details of composition are given. Tests of stability and liquefaction capacity of aqueous emulsion gels formed by mixing the preparation with different proportions of gelatin were carried out, the mixtures being stored in polyamide/polyethylene or polypropylene/Al/polyester laminate sachets at room temp. or at 5–7°C. It was found that emulsions containing 5% of the smoke preparation and 10% gelatin proved the most stable from the viewpoints of maintaining liquefaction capacity and resistance to discoloration (particularly in Al laminate packs), and retained quality in storage for up to 6 months at 5–7°C. SKK

53

Liquid smoke and its production.
Ledford, C. D. (Baltimore Spice Co.)
United States Patent 4 298 435 (1981) [En]

An improved process for producing liquid smoke from hard woods is described in which wood fines are dried, calcined in the absence of added air, and the wood smoke is fractionated by absorption in an aqueous liquid. The liquid smoke has superior meat colouring properties. AS

54

[Modelling the process of curing smoke formation.]
[Lecture]
Kurko, V. I.; Kolonistova, I. V.; Makarova, N. A.
Proceedings of the European Meeting of Meat Research Workers No. 26, Vol. II, L-17, pp. 170–173 (1980) [Ru] [Vses. Nauchno-issled. Inst. Morskogo Rybnogo Khozyaistva i Okeanografii, Moscow, USSR]

An illustrated description is given of a unit designed to model the process of smoke formation during curing of foods by burning different types of wood. The unit permits development of equipment for commercial scale production of high quality curing smoke with low resin contents. [See FSTA (1982) 14 8S1397.] HBr

55

[Method for determination of phenolic compounds in smoked products.]
Radecki, A.; Grzybowski, J.
Bromatologia i Chemia Toksykologiczna 14 (2) 129–134 (1981) [13 ref. Pl, en, ru] [Zaklad Chem. Fizycznej Akad. Med., Gdansk, Poland]

A GLC method, involving prior treatment of the sample with trimethylchlorosilane, was developed for detn. of phenolic compounds in smoked meat and fish products. Using sprats, cod, mackerel, bacon, 2 types of ... as test items, 7 different compounds

56

[*N*-nitrosamines in beer and several non-alcoholic beverages.]
Zhukova, G. F.; Somina, S. I.; Ipatova, G. P.; Medvedev, F. A.; Bershova, T. M.
Voprosy Pitaniya No. 1, 48–50 (1982) [8 ref. Ru, en] [Inst. Pitaniya AMN SSSR, Moscow, USSR]

N-nitrosamines [NN] content was determined in 11 bottled beers (light and dark; domestically produced and imported), 3 Kvass wort concentrates, 'Russkii Kvas' bottled kvass, smoke-dried pear and 'Grushevyi' beverage made from the smoke-dried pear. Sample preparation (using an N-nitrosodipropylamine internal standard) and NN separation techniques are described, NN contents being determined by a fluorescence method and an MS-TLC method. *N*-nitrosodimethylamine [NNDA] was the only nitrosamine detected in the samples, and then only in insignificant quantities (tabulated): NNDA was either absent or present in trace amounts up to 0.8 µg/l (in a beer sample). NN contents in domestically produced beers are claimed to be lower than in imported beers. Although NN were not detected in the dried pear, the possible occurrence of NN in fruits treated by this smoking treatment cannot be ignored, and further trials on this aspect are considered necessary. RAW

57

Method of producing improved starch by smoking.
Ohira, T.; Miyano, R.; Yoshida, R. (Ajinomoto Co. Inc.)
United States Patent 4 303 452 (1981) [En]

Method for producing improved starch is described, in which starch having a water content of ≤50% is subjected to smoke treatment. Suitable starches include corn, potato, wheat and rice, and ≥2 starches may be used together. The smoked starch product can be incorporated into various foods, e.g. fish paste, meat pastes and confectionery products, the final food products having desired properties, and good flavour and taste. RAW

58

[Volatile components of smoked herring.]
Kasahara, K.; Nishibori, K.
Bulletin of the Japanese Society of Scientific Fisheries [Nihon Suisan Gakkai-shi] 47 (6) 783–786 (1981) [3 ref. Ja, en] [Notre Dame Seishin Univ., Okayama 700, Japan]

Head-space volatiles, steam-distilled volatiles, and volatiles in acid, phenol, and non-carbonyl neutral fractions of smoked and raw herrings were analysed by GLC and GC-MS and were identified by comparison of their mass spectra and retention times with those of authentic compounds. 48 volatile components (15 acids, 16 phenols, 3 carbonyls, 4 alcohols, 4 esters, 4 hydrocarbons, and 2 other components) from the smoked herring and 6 volatiles (1 acid and 5 hydrocarbons) from the raw herring were identified. The phenolic substances were the chief volatiles of smoked herring and were considered to come from the volatiles of wood smoke. On the other hand, the hydrocarbons in the volatiles of smoked herring seemed to come from fish flesh. AS

59

[Contents of benzo[a]pyrene in sausage products.]
Ruchkovskii, B. S.; Tikhtin, L. A.; Palyura, A. N.
Voprosy Pitaniya No. 1, 62-63 (1982) [9 ref. Ru, en]
[Inst. Problem Onkologii im R. E. Kavetskogo AN UkSSR, Kiev, USSR]

In a comparison of smoking and 'wet curing', (i) semi-smoked Ukrainskaya, (ii) raw smoked Grudinka Svinaya, and (iii) boiled Doktorskaya sausages were either treated with a smoke-air mixture (36–48 h for (i), and 3–4 days for (ii)) or the Vakhtol' curing solution. Average BP (benzo[a]pyrene) contents (μ/kg) in smoked products were 2.34 ± 0.52 in (i), 3.69 ± 0.41 in (ii), and 0.20 ± 0.04 in (iii), and in Vakhtol' treated sausages BP was either not detected or was found in trace amounts (<0.002 μg/kg); BP was not detected in the Vakhtol' solution itself (data tabulated for 28 sausage samples and 3 solution samples). 'Wet' smoking using Vakhtol' curing solution) is recommended for use in the food industry. RAW

60

Specification for smoked bacon.
India, Indian Standards Institution
Indian Standard IS 2475-1979, 10pp. (1980) [En]

This standard, first revision of the 1968 standard, prescribes requirements and methods of sampling and test for smoked bacon (dry-cured or pickle-cured) prepared from pork bellies (streaky bacon) and loins (back bacon). AL

61

[Solvent for individual polarographic determination of copper and lead.]
Balesnaya, A. N.; Levin, A. Ya.; Shragovich, Ya. Z.
Gigiena i Sanitariya No. 1, 77-78 (1982) [4 ref. Ru]

The Soviet Standard GOST 18293-72 on "Drinking water" recommends a 0.1N orthophosphoric acid solvent for polarographic detn. of Cu and Pb; although this solvent distinguishes Cu and Pb, other metals (Ni, Cd, Zn) cannot be determined simultaneously. A new solvent for simultaneous detn. of (i) Cu, Pb, Cd, Ni and Zn in a sample was compared with the GOST solvent. The new solvent contains (in 1 l) 110 g NH_4Cl, 110 g KCl and 90 ml of 25% ammonia: before introduction into the cell, to 5 ml solvent are added 0.3-0.4 g ascorbic acid and 0.3-0.4 g Na_2SO_3. Polarographs are given for (i) using the 2 solvents: clear peaks for all the elements are only visible using the new solvent. RAW

62

[Controlling the process of cold smoking fish products.]
Kichkar', Yu. E.; Nasibov, Z. G.; Bunin, D. Kh. **(Union of Soviet Socialist Republics, Krasnodarskii Politekhnicheskii Institut; Union of Soviet Socialist Republics, Vsesoyuznyi Nauchno-issledovatel'skii Institut Morskogo Rybnogo Khozyaistva)**
USSR Patent 847 973 (1981) [Ru]

To reduce process time and improve product quality, the temp. and flow rate of the smoke are stabilised, and a temp. difference of 0.5-4°C is maintained between the product surface and a 'wet thermometer' in the smoke. W&Co

63

Canning of smoked mackerels. I. Standardisation of canning methods.
Prabhu, R. M.; Saralaya, K. V.; Nagaraj, A. S.
Mysore Journal of Agricultural Sciences 15 (1) 113-119 (1981) [14 ref. En] [Coll. of Fisheries, Univ. of Agric. Sci., Mangalore-575 002, India]

Smoke cured mackerels (*Rastrelliger kanagurta*) were canned in (i) full size, (ii) half size and as (iii) fillets, to enhance the palatability and storage life, and the process was standardized. The important steps included brining of fresh fish in a saturated solution of common salt, smoking in a locally designed smoking chamber using sawdust and wood shavings, precooking and thermal processing in autoclaves, and packing in a medium of refined groundnut oil. The can sizes used were No. 1 tall, 8-oz and quarter dinglay. The canned product was evaluated for quality based on physicochemical analysis and taste panel, and was found acceptable. The optimum conditions of brining time (min), smoking time at 55 ± 5°C (min) and precooking time at 100°C (min) were 15, 19 and 20 for (i), 10, 60 and 20 for (ii) and 5, 6 and 20 for (iii) resp. CFTRI

64

[Effects of feeding γ-irradiated fish on the embryogenesis and chromosomes of white rats.]
Zaitsev, A. N.; Maganova, N. B.
Voprosy Pitaniya No. 6, 61-63 (1981) [7 ref. Ru, en]
[Inst. Pitaniya AMN SSSR, Moscow, USSR]

Animal toxicity trials were performed to determine the effects of γ-irradiated fish in the diet. Embryogenesis was studied in groups receiving diets including (i) fresh fish γ-irradiated at 400 kRad, (ii) hot smoked fish γ-irradiated at 200 kRad, or (iii) a control diet including fresh cooked or hot smoked fish without γ-irradiation; and long term cytogenic effects on bone marrow were assessed in groups (up to 4 generations) fed diets including (iv) fresh fish γ-irradiated at 200 kRad, (v) hot smoked fish irradiated at 200 kRad, or receiving the control diet (iii). Results were similar for control (iii) and test groups (i) and (ii); (i) and (ii) had no effect on embryonic development. Similarly, in comparison with (iii), diets (iv) and (v) did not cause visual structural and quantitative changes in the chromosomes. RAW

65

Smoking and drying.
Anon.
Fishing News International 21 (3) 42-45 (1982) [En]

The history of fish smoking and drying is briefly discussed, and some process plants (4 continuous Atmos models and the Afos Torry kilns including its Mini-kiln) are described. The Fishmaster systems, produced by Maurer und Söhne of the Federal German Republic, which can be used for drying, cooking, hot air finishing, steam-smoking and defrosting as well as hot and cold smoking are briefly described. The technology of fish smoking in Ghana is also dealt with, covering types of ovens, pre-smoking treatment of fish, methods of smoking, materials used for smoke production, and improvements needed. AL

66

[Electrostatic smoking: efficiency in relation to two technological parameters.]
Girard, J.-P.; Talon, R.; Sirami, J.
Sciences des Aliments **2** (1) 1–15 (1982) [9 ref. Fr. en] [Sta. de Recherches sur la Viande, INRA, Theix, 63110 Beaumont, France]

Studies were conducted on electrostatic smoking of bacon, with special reference to effects of electrode/product distance (60 or 20 cm) and duration of smoking (1 or 2 h). Results of electrostatic smoking were compared with those of conventional smoking. Data are given for effects on concn. of phenols, carbonyl compounds and polycyclic aromatic hydrocarbons in the bacon. Samples were also evaluated organoleptically. Electrostatic smoking with a 20 cm product/electrode distance increased concn. of phenols, carbonyls and 3,4-benzpyrene in the bacon as compared to traditional smoking; a product/electrode distance of 60 cm gave results similar to traditional smoking. Electrostatic smoking was more rapid than traditional smoking. AJDW

67

[Aroma of foods.] (In *'Problemy kachestva i biologicheskoi tsennosti pishchevykh produktov'* [see FSTA (1982) 14 11G722].)
Simonova, V. N.; Antonov, N. A.
pp. 68–77 (1979) [Ru] [Leningradskii Inst. Sovetskoi Torgovli im. F. Engel'sa, Leningrad, USSR]

Generally accepted methods for extraction of volatile aroma compounds from foods are outlined. The GLC method used to study aroma compounds obtained by vacuum distillation from (i) beef, (ii) cold-smoked mackerel, and (iii) soluble coffee is described in detail. Chromatograms of the 3 products are presented. Some 60 peaks were detected in (i) chromatogram on the 'Tsvet-104' instrument, but their identification is considered difficult. (ii) showed some 65 peaks on the LKhM-8MD 4 instrument, and identification of the phenolic fraction is tabulated, proportions of 15 named compounds and 6 not identified being presented. The 'Tsvet-1 64' instrument was used for (iii). Carbonyl compounds predominated; 17 identified peaks are named, 1 was not identified. SKK

68

Smoker device.
Harmon, J. R.
United States Patent 4 309 938 (1982) [En]

A smoker device includes a smoke chamber, a smoke generator mounted to the bottom of the chamber, and a number of conveyors positioned to move food through the smoke chamber in an alternating path from an entry opening to an exit opening. The associated ends of successive conveyors have complementary shaped portions for the food to be inverted as it passes from a 1st conveyor to a 2nd conveyor and to inhibit overlapping or other disarray of the food as it passes from 1 conveyor to the next. AS

69

[Use of mathematical methods in quality evaluation of foods.] (In *'Problemy kachestva i biologicheskoi tsennosti pishchevykh produktov'* [see FSTA (1982) 14 11G722].)
Patrakova, L. D.; Gurenkov, M. K.; Prokopenko, S. T.; Kharenko, N. F.
pp. 94–102 (1979) [Ru] [Leningradskii Inst. Sovetskoi Torgovli im. F. Engel'sa, Leningrad, USSR]

The method of G. B. Chizhov (no reference or details given) for calculation of generalized numerical quality of foods involving selection of the characteristics most important for quality, establishment of the max. accurate weighting of each characteristic in the total quality, and selection of a qualimetric standard of comparison with the calculated value was tested using the experimental data of E. N. Lazarev & S. T. Prokopenko of the Institute named in the address (no reference given) on storage changes of hot-smoked fish packaged in polyethylene/cellophane, PTs-2 film under CO_2, under vacuum, or by adhesion lamination, or packaged in parchment. Values for contents of moisture, amino and ammonia N and carbonyl compounds, and titratable acidity and total bacterial count, tabulated for 6 storage durations ≤30 days, were used in the calculations. Graphs of changes in generalized numerical quality and of relative changes during storage agreed closely and showed that vacuum and CO_2 packaging were markedly superior to adhesion packaging, which in turn was clearly superior to parchment packaging. SKK

70

Measuring phenol content of smoked whitefish.
Teeny, F. M.
Marine Fisheries Review, National Oceanic and Atmospheric Administration 44 (2) 21–22 (1982) [En]

A fast and reproducible method was developed for extracting and measuring phenolics from fish treated by liquid smoke, and it was applied to smoked whitefish. Two lots of fish were brined for 2 days in 3.2% NaCl prior to dipping in a smoke solution for 2 and 60 s, another lot was held 2 days in brine containing 3 oz liquid smoke/gal. All 3 lots were equilibrated for another day at 38°F. Results showed phenol concn. of 5.40, 5.67 and 8.58 mg/100 g fish resp. Excellent agreement was obtained for replicate analyses. RM

71

['Dark' smoking at high smokehouse temperature.]
Dunkelräuchern bei erhöhter Kammertemperatur.
Potthast, K.
Fleischwirtschaft 61 (11) 1630, 1632, 1634–1636, 1641; 1708 (1981) [19 ref. De, en] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

The effects of smoking practice on benzo[a]pyrene (BP) concn. in smoked meat products were studied. The following results were obtained: BP concn. is not greatly affected by the smokehouse temp. but depends mainly on the smoke generation temp.; high BP contents in smoked meat products can be expected at smoke generation temp. >700°C, and especially >1000°C; at lower temp., the type of wood and even addition of large amounts of resinous wood had no appreciable effect on the BP content of smokehouse smoke and smoked meat products. Optimum smoke generation temp. ensuring high contents of the desirable phenol compounds and low BP was 650–700°C. High wood moisture content (50%) enhanced temp. stability during combustion, and gave low BP concn. in the products. Particularly high BP contents were found in 'black' smoked products (with sooty surface), indicating high smoke generation temp. Development of the smoked aroma was greatly affected by the composition of the wood: differences in phenol composition indicated differences in flavour. The phenol spectra showed the type of wood used for smoke generation (high guaiacol concn. for hard wood, high syringol for soft wood). The development of aroma and tenderness in hot-smoked ham was favourably affected by smoking at the optimum temp. for cathepsin activity (about 37–40°C). [From En summ.] RM

72

[Use of the soil in meat production. Evaluation of genotypes and management systems.]
Quintana, F. O.
Ciencia y Tecnica en la Agricultura, Rumiantes 2 (1/2) 65–78 (1979) [10 ref. Es, en]

This paper on effects of 5 fodder crops and 2 management systems on performance of slaughter bulls includes data for the carcass quality of 213 (i) Holstein × Zebu, 213 (ii) Brown Swiss × Zebu and 284 (iii) commercial Zebu bulls. (ii) had the highest and (iii) the lowest % meat in the carcass and meat:bone ratio; other carcass characteristics did not differ significantly, although there was a tendency for (iii) to have the poorest carcass quality. AJDW

73

[Use of yeast extract in sausage manufacture.]
Slyusarenko, T. P.; Tsimbalova, N. M.; Zvyagintseva, S. P.; Lyapun, Yu. S.
Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 3, 67–70 (1981) [6 ref. Ru] [Kievskii Ordena Trudovogo Krasnogo Znameni Tekh. Inst. Pishchevoi Promyshlennosti, Kiev, USSR]

Yeast extract may replace part of the meat in sausage-type smoked meat products; its nutritional value is approx. equal to that of beef. Organoleptic properties of the extract are acceptable, and it can be added to almost any type of smoked product. Optimum level of addition depends on the product, but is generally 1–2%. The extract may increase the protein content of some products. STI

74

Liquid smoke stays brine-soluble.
Wesley, P.
Food Development 16 (2) 30–31 (1982) [En]

Red Arrow Products Co. of Manitowoc, Wisconsin, USA have developed Aro-Smoke P.50, a liquid smoke which includes a much higher ratio of emulsifier to phenols than other liquid smokes. This allows the flavouring to operate in brines up to 90° salinity. Selective extraction of smoke flavour components, in Aro-Smoke P-50, has allowed the developers to isolate more of the oil-soluble phenols which afford 'mellower' flavour and to avoid harsher, more medicinal-tasting water-soluble phenols. The Aro-Smoke was originally formulated for meat applications and has been adapted to cheese-making. Sausage-makers use titratable acidity as a measure of the level of liquid smoke in smoke-brined solutions, particularly to determine when the smoke flavouring has been depleted in the brine. Cheese processors check the level of phenols present to monitor the rate of smoke depletion. VJG

75

[Smoking oven.] Räucherofen.
Janssen, H.
German Federal Republic Patent Application 3 029 409 (1982) [De]

The oven, for smoking fish or meats, comprises a curing chamber, containing ≥1 grates, and a fireplace for that chamber. The oven has L-shaped construction; the fireplace is offset next to the curing chamber in the horizontal arm of the L. A grill-device is situated above the fireplace, its back being adjacent to a side-wall of the curing chamber. W&Co

76

[Identification of smoked salmon sold in Italy.]
Balzaretti, C.; D'Aubert, S.; Ambrosini, P.
Ristorazione Collettiva 7 (3) 121–122 (1982) [1 ref. It, en] [Istituto di Ispezione degli Alimenti di Origine Anim., Univ. degli Studi di Milano, Milan, Italy]

Newton's procedure for identification of spp. of smoked salmon by examination of the scales [see FST (1980) 12 2R110] is briefly described. Studies on 28 commercial samples of smoked salmon showed 50 to be *Oncorhynchus tschawtscha* (chinook salmon), 46.4% to be *O. kisutch* (coho salmon), and 3.57% to be *O. gorbuscha* (pink salmon). No samples of *O. keta* (chum salmon) or *O. nerka* (sockeye salmon) were detected. AJDW

77

[Laboratory apparatus for studying the properties curing smoke.]
Gorokhov, Yu. I.; Kurko, V. I.
Rybnoe Khozyaistvo No. 11, 67–69 (1981) [Ru] [VNIRO, USSR]

A newly developed laboratory device enables the mechanism of sorption of individual components of smoke to be studied in relation to the surface state of fish. The basic criterion was the contents of phenols model samples (cellulose casings filled with distilled water). The phenol content was determined by reacti with 4-amino-antipyrine. Results showed that at increased temp. more phenols were sorbed from the vapour phase than from the dispersion phase, and al more phenols were sorbed from the vapour phase at RH 65% than at RH 85%. The reverse relations wer observed between RH and sorption of phenols from dispersion phase. STI

78

[Volatile components of smoked sardine.]
Kasahara, K.; Nishibori, K.
Bulletin of the Japanese Society of Scientific Fisheries [Nihon Suisan Gakkai-shi] 47 (1) 113–119 (1981) [2 ref. Ja, en] [Notre Dame Seishin Univ., Okayama 700, Japan]

To examine the masking effect of smoke flavour on the undesirable odour characteristic of cooked sardine, the volatiles of the smoked sardine were compared with those of raw sardine and the non-smoked dried sardine by organoleptic test, GLC, and gas chromatography-MS analyses. In organoleptic test, most of the panel members could not detect the undesirable sardine odour in the smoked sample and preferred the smoked sardine flavour. In GLC and gas chromatography-MS analyses, 39 volatile components (9 carbonyls, 3 alcohols, 16 phenols, 2 esters and 9 hydrocarbons) from the smoked sardine, 9 hydrocarbons from raw sardine, and 18 volatiles (8 carbonyls, 2 alcohols and 8 hydrocarbons) from dried sardine were identified. In the smoked sardine, phenolic volatiles were considered to play an important role in masking the undesirable odour of the sardine. AS

79

[Complex evaluation of quality of baked smoked sausages containing precipitated plasma proteins.]
Zharinov, A. I.; Tarasova, T. N.; Prusak-Glotov, V. E.; Vil'egas Arguel'es, Kh. R.[Villegas Arguelles, H. R.]; Presa Kabalero[Presa Caballero], O. B.; Toledo Gonzales, M.
Myasnaya Industriya SSSR No. 7, 33–37 (1981) [10 ref. Ru] [Moskovskii Tekh. Inst. Myasnoi i Molochnoi Promyshlennosti, Moscow, USSR]

A method of manufacture of (i) a blood plasma protein preparation, by denaturation in the presence of synergists is described. Experimental batches of raw smoked sausages were prepared using either (i), or (ii) liquid blood plasma, replacing an equal quantity of lard. Results show that replacement of lard by either (i) or (ii) increased moisture and protein contents and decreased fat content; this persists during subsequent storage. Water binding capacity of sausages made with (ii) is higher than that of sausages made with (i). STI

80

[The new generation of combined smoking and scalding units.] Die neue Generation kombinierter Räucher- und Brühanlagen.
Reich, W.
Fleischerei 33 (5) 328, 330–331 (1982) [De] [Reich GmbH & Co. KG, Postfach 1304, D-7064 Remschalden, Federal Republic of Germany]

Modern smoking/scalding units for processing meat products are described, with reference to: overcoming problems with air pollution; recirculation of smoke in a closed system; friction-type smoke generators; and microprocessor control systems. AJDW

81

A comparison of curing practices and sodium nitrite levels on the chemical and sensory properties of smoked turkey.
Sheldon, B. W.; Ball, H. R.; Kimsey, H. R., Jr.
Poultry Science 61 (4) 710–715 (1982) [13 ref. En] [Food Sci. Dep., N. Carolina State Univ., Raleigh, N. Carolina 27650, USA]

3 different curing procedures using 2 levels of $NaNO_2$ were evaluated for colour, residual NO_2^-, % NaCl, % moisture, and organoleptic quality of smoked turkey. Curing procedures included (i) soaking in a 15% NaCl brine for 48 h prior to cooking, (ii) injecting an amount of 15% salt brine equal to 10% of the carcass wt. followed by soaking in 15% brine for 24 h, and (iii) injecting brines to obtain a finished product with 2% salt and cooking immediately. Turkeys were smoked while cooking to an internal temp. of 71°C. Smoked breast meat from turkeys cured with reduced amounts of NO_2^- had significantly lower residual NO_2^-. (iii) yielded breast meat with the highest concn. of residual NO_2^- and salt. Hunter colour "a" values demonstrated no cured colour difference in breast tissues due to concn. of NO_2^- in curing brine, whereas significant colour differences resulted from cure methods. Injection with immediate cooking resulted in less uniform colour development. Product with higher levels of residual NO_2^- and salt received higher, but not significantly different, taste panel scores for cured meat flavour intensity, salt intensity, and juiciness. These results show that cured meat flavour and colour can be produced in turkey breast tissue with 25% of the max. permitted levels of $NaNO_2$. The results also suggest that curing time can be reduced if more uniform colour can be obtained with direct injection of brine followed by immediate cooking and smoking. AS

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